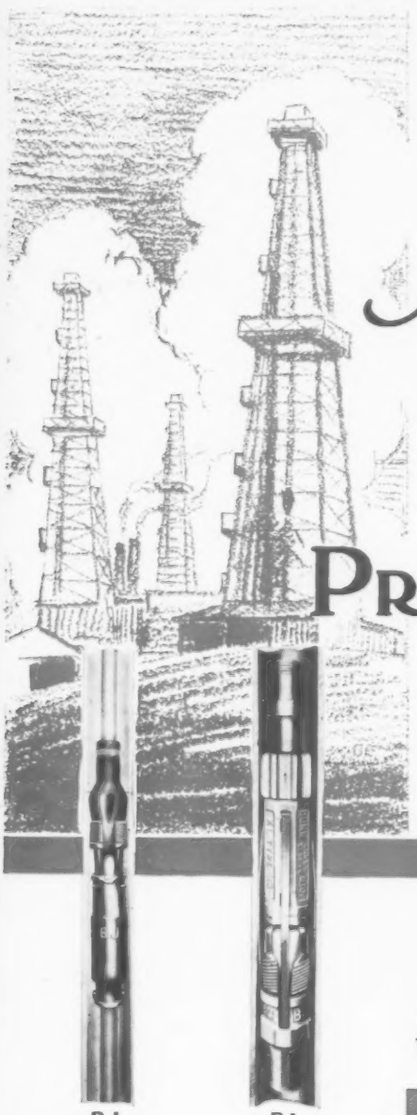
The OIL WEEKLY

15¢ A COPY

Exclusively Devoted To The Production and Transportation of Oil and Gas

Engineering News Statistics

August 1, 1930 Volume 58. No. 7



continuous, dependable *performance*

BJ

PRODUCTION EQUIPMENT

BJ AUTOMATIC TUBING CATCHER

BJ DUNN TUBING STOP

BJ CENTER LATCH TUBING ELEVATOR (Wilson)

BJ SUCKER ROD ELEVATOR

BJ "SNAPON" TUBING TONGS

BJ SAFETY ROD & TUBING HOOK

WRITE FOR COMPLETE INFORMATION

BYRON JACKSON CO.

Established 1872

General Offices: 2150 East Slauson Avenue, Los Angeles, California

TULSA OKLAHOMA CITY HOUSTON SHREVEPORT NEW YORK CITY

DRILLERS quickly recognize the fast and efficient digging features of this new bit.

Designed so as to co-ordinate the simplicity and advantages of the fishtail bit with the smoother action of bits of newer type, the Elliott embodies every quality that past experience has proved essential to highest efficiency in modern oil well drilling operations.

Drilling in tough, sticky and hard formations has proved it to be one of the most efficient bits for economy of power, smooth running, and exceptional hole-making ability.

Supplied in all standard sizes from 3⅞" to 25½" inclusive. Descriptive folder on request.

The Elliott DRILLING BIT

Elliott
CORE DRILLING COMPANY
4731 East 52nd Drive
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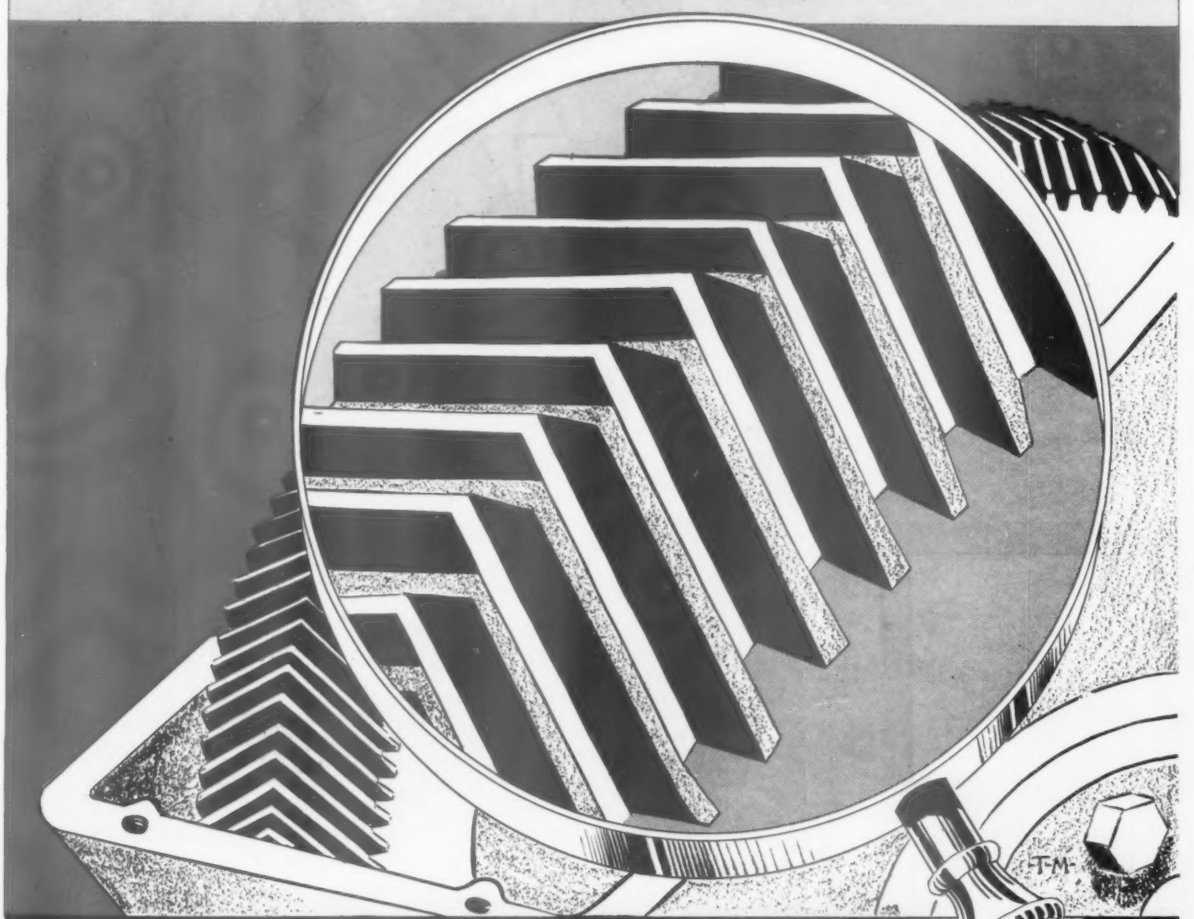
Export Office:
150 Broadway, New York

The OIL WEEKLY. Issued weekly by the Gulf Publishing Co., 3301 Buffalo Drive, Houston, Texas. Subscription price $1.00 per year; 15 cents per copy. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

GASO PUMPS INVITE THE CLOSEST INSPECTION



Close inspection of Gaso Pumps reveals features which are reassuring to the purchaser—correct design in accordance with the most advanced engineering principles—materials carefully selected for suitability and quality—workmanship of an accuracy made possible only by a combination of complete mechanical facilities and workmen especially trained to Gaso standards of precision.

Gaso Pumps are built exclusively for the industry which is so crammed with action that conditions of usage are often severe in the extreme. And these pumps are built to deliver pleasing service in spite of the excessive demands to which they are subject.

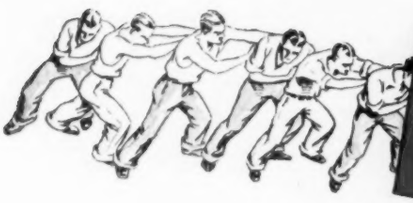
Send your requirements for full information regarding Gaso Pumps to meet any oil industry need.

GASO PUMP & BURNER MFG. COMPANY, Tulsa, Okla.

Dallas, Texas New York, N. Y.

GASO PUMPS

for every oil industry need

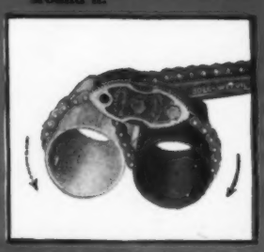


Push Down

"MAKING UP"
Simply lay the tongs on top of pipe, hook chain around it, engage rearward teeth and push down.

"BREAKING OUT"
Pull tongs back to engage forward teeth and lift up.

NO HOLDING UP
To apply, lay the tongs on top of pipe and hook chain around it.



REVERSIBLE ACTION
Always ready for either "making up" or "breaking out" without unhooking chain from pipe.

"Boll-Weevil" is Self Releasing

Push down! That's all you have to do to "make up" pipe with Williams' new tongs.

"Vulcan Boll-Weevil" was designed for pipe line and flat pipe work. It was named for the men who use it. This tongs simplifies their labor. Note the description at the left.

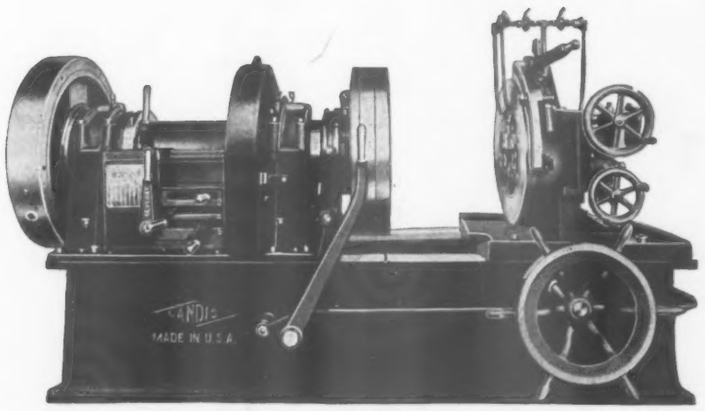
"Vulcan Boll-Weevils" are fitted with reversible jaws providing double life. Chains are proof-tested and CERTIFIED. Four sizes for 3/4 to 12″ pipe.

J. H. WILLIAMS & CO.
"The Wrench People"
New York BUFFALO Chicago

WILLIAMS
SUPERIOR DROP-FORGED TOOLS

VULCAN BOLL-WEEVIL CHAIN PIPE TONGS

For Oil Country Threading —LANDIS



The Landis Pipe Threading and Cutting Machine—available in 2-4-6-8-12-16-18 and 20 inch sizes for the threading of oil country tubular goods.

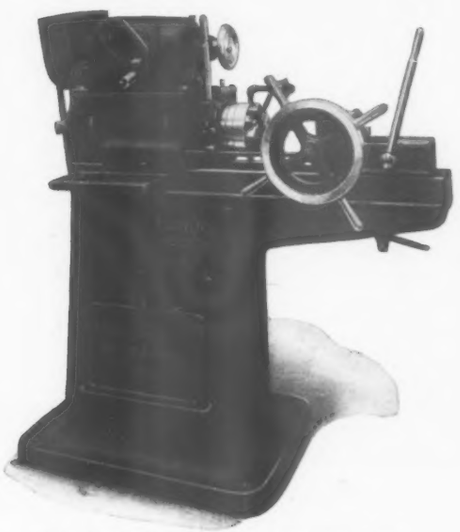
For oil country threading, in the field or supply shop, Landis has a machine, die head or tap that gives satisfactory service.

Pipe, casing, drill pipe, line pipe and tubing to 20″ in diameter are easily handled by the Landis Pipe Threading and Cutting Machine. This machine will maintain a high production of threads that are consistently accurate and that meet A.P.I. specifications fully.

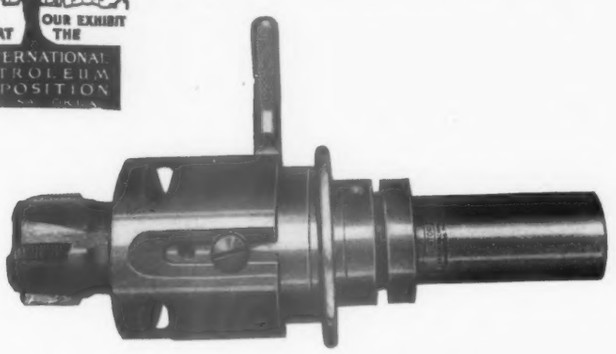
Victor Collapsible Taps, made in straight, tapered and receding chaser models are available for practically all oil country tapping.

The Landis Bolt Threading Machine is readily adapted to all conditions of service. Especially in oil country threading where the jobs are diversified and the machine is changed from one job to another is this unit indispensable.

Let us tell you more about Landis Threading Equipment for the oil fields.



The Landis ¾″ Single Head Threading Machine—made in single and double spindle models. Landis Threading Machines are made in sizes ranging from ¾″ to 4″



The Victor Collapsible Tap—Victor Taps are made in stationary and rotary models for internal threading from 1″ to 24″ in diameter.

LANDIS TRADE — MARK

LANDIS MACHINE COMPANY, Inc.

WAYNESBORO, PENNA.

Represented in the domestic oil fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; D. S. Mair Machinery Co., Houston, Texas; Woodward Wight & Co., New Orleans, La.; Herberts Machinery Co., Ltd., Los Angeles, Calif.; Herberts Moore Machinery Co., San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

THE BIGGEST YET

Spang made these large bits for export service. And big as they are—these bits are of just as splendid quality as other sizes of Spang bits, and they received just the same careful heat treatment.

Large or small, Spang Bits are of only one character as to quality. The standard for Spang is distinctly *"the higher standard."*

SPANG & COMPANY
Butler, Pa.

SPANG

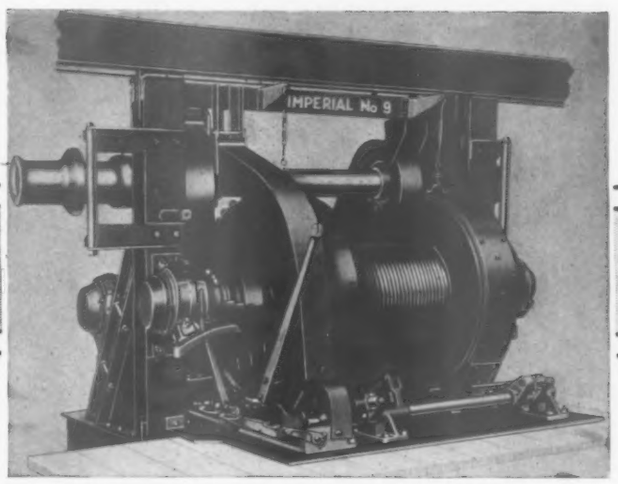
the HIGHER STANDARD

WELDLESS JARS

THE STANDARDIZED HEAVY DUTY BEARING OF THE OIL INDUSTRY

AMERICAN ROLLER BEARINGS HEAVY DUTY

PROGRESS in HOISTS



The "Oil Well" Imperial No. 9

HOIST

The entire hoist is American self-aligning roller bearing equipped. Bearings are Alemite lubricated and guarded against intrusion of dirt. Bearing housings on the jack shaft and line shaft are interchangeable. Line and jack shafts are each eight inches in diameter. All shafts can be completely stripped of sprockets, clutches, drum and collars on the derrick floor.

One more step forward—

A new design—an advanced standard of construction—all for the purpose of handling heavy loads better than before. And since the basis of satisfactory operation rests on the quality, the choice continues to be

AMERICAN HEAVY DUTY ROLLER BEARINGS

AMERICAN ROLLER BEARING COMPANY, PITTSBURGH, PA.

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Your customers are no further away than the telephone on your desk

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Atlanta, Ga.		3.50	2.35	1.65	2.15	4.50	2.35	1.75	2.55	2.75	3.25	3.00	3.00	2.55	7.75	1.95	2.35
Boston, Mass.	3.50		3.25	3.00	2.35	6.50	2.55	3.00	3.25	1.05	.70	1.00	4.50	1.25	9.50	3.75	1.65
Chicago, Ill.	2.35	3.25		1.20	1.45	3.50	1.15	.90	.50	2.75	3.00	3.00	1.80	2.55	6.75	1.25	2.55
Cincinnati, Ohio	1.65	3.00	1.20		1.25	4.00	1.15	.60	1.50	2.35	2.55	2.35	2.55	2.15	7.25	1.45	1.80
Cleveland, Ohio	2.15	2.35	1.45	1.25		4.50	.60	1.25	1.65	1.70	1.95	1.80	3.00	1.60	7.75	2.05	1.45
Denver, Colo.	4.50	6.50	3.50	4.00	4.50		4.25	3.75	3.50	6.00	6.25	6.00	2.05	5.75	3.75	3.25	5.50
Detroit, Mich.	2.35	2.55	1.15	1.15	.60	4.25		1.15	1.25	1.95	2.15	2.05	2.75	1.85	7.50	1.95	1.70
Indianapolis, Ind.	1.75	3.00	.90	.60	1.25	3.75	1.15		1.20	2.55	2.75	2.55	2.15	2.35	7.00	1.10	2.05
Milwaukee, Wis.	2.55	3.25	.50	1.50	1.65	3.50	1.25	1.20		3.00	3.00	3.00	1.75	2.75	6.75	1.50	2.55
Newark, N. J.	2.75	1.05	2.75	2.35	1.70	6.00	1.95	2.55	3.00		.50	.15	4.00	.50	9.00	3.25	1.00
New Haven, Conn.	3.25	.70	3.00	2.55	1.95	6.25	2.15	2.75	3.00	.50		.50	4.25	.80	9.25	3.50	1.30
New York, N. Y.	3.00	1.00	3.00	2.35	1.80	6.00	2.05	2.55	3.00	.15	.50		4.25	.50	9.00	3.25	1.05
Omaha, Neb.	3.00	4.50	1.80	2.55	3.00	2.05	2.75	2.15	1.75	4.00	4.25	4.25		4.00	5.25	1.65	3.75
Philadelphia, Pa.	2.55	1.25	2.55	2.15	1.60	5.75	1.85	2.35	2.75	.50	.80	.50	4.00		8.75	3.00	.75
San Francisco, Cal.	7.75	9.50	6.75	7.25	7.75	3.75	7.50	7.00	6.75	9.00	9.25	9.00	5.25	8.75		6.50	8.50
St. Louis, Mo.	1.95	3.75	1.25	1.45	2.05	3.25	1.95	1.10	1.50	3.25	3.50	3.25	1.65	3.00	6.50		2.75
Washington, D.C.	2.35	1.65	2.55	1.80	1.45	5.50	1.70	2.05	2.55	1.00	1.30	1.05	3.75	.75	8.50	2.75	

It is your business pathway to the world . . . quick, convenient, inexpensive

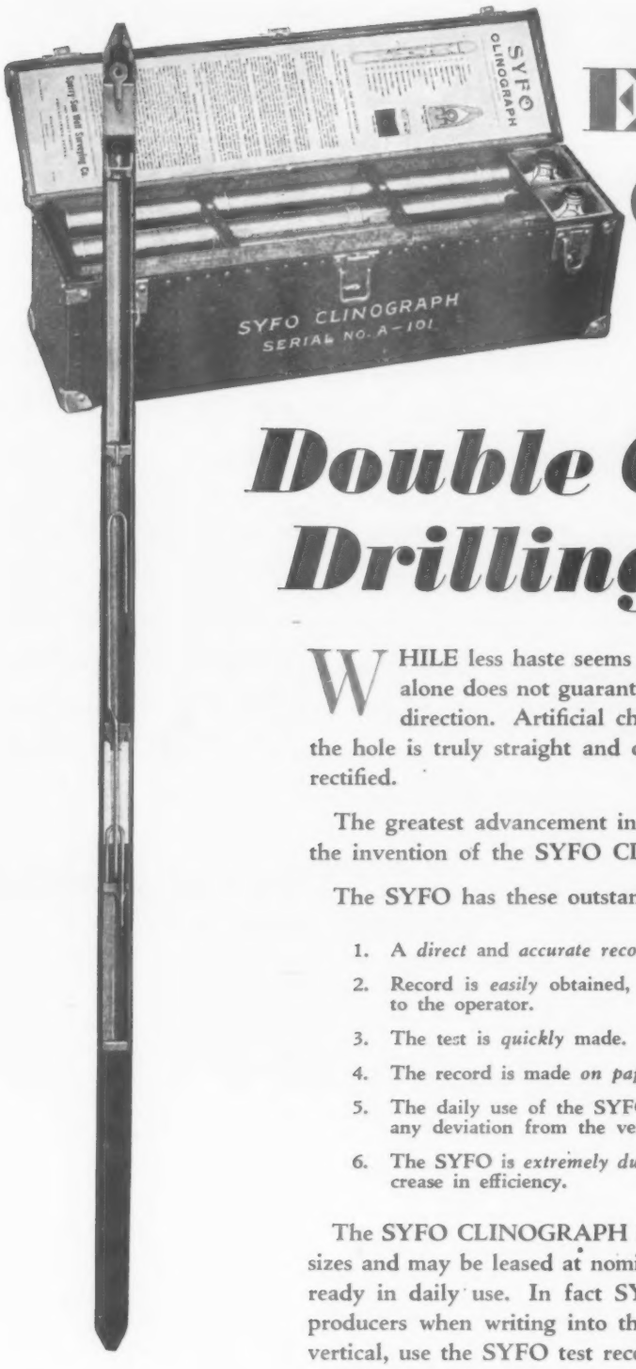
THE TELEPHONE takes you "there and back" in minutes. You can transact business over thousands of miles without leaving your desk. "See" as many people as you wish. Give or receive a definite answer immediately . . . at a saving of time and money.

There are two kinds of out-of-town calls: *person-to-person*—when you ask the operator to summon a specific person to the telephone; and *station-to-station*—when you will talk with any one who answers. Station-to-station calls are cheaper. The charges can be reversed without additional cost on person-to-person calls and on many station-to-station calls.

Features of Bell Telephone service which are of particular aid in sales work include the *Key Town Plan*, for covering territories from key cities by telephone . . . *Sequence Calling Lists*, for putting through any number of calls in rapid succession . . . *Credit Cards*, which make it possible for traveling representatives to charge their telephone calls to the home office.

Doing business by telephone widens the sphere of your activities. There have been four reductions in inter-city telephone rates during the past four years. The average Long Distance call goes through in approximately two minutes. Bell Telephone service is *Quick . . . Convenient . . . Inexpensive.*

BELL SYSTEM
AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES



ELIMINATE CROOKED HOLES

Double Check Your Drilling Progress

WHILE less haste seems to be the order of the day in drilling, that alone does not guarantee that the hole is headed in a true vertical direction. Artificial checks must be employed to make sure that the hole is truly straight and deviation from the vertical can then be rectified.

The greatest advancement in well surveying has been made possible by the invention of the SYFO CLINOGRAPH (Patents pending).

The SYFO has these outstanding advantages:

1. A *direct* and *accurate record* of the vertical inclination.
2. Record is *easily* obtained, without the use of acids with their danger to the operator.
3. The test is *quickly* made.
4. The record is made *on paper* which can be *filed* for reference.
5. The daily use of the SYFO enables the driller to *immediately* correct any deviation from the vertical.
6. The SYFO is *extremely durable* and will last for years without any decrease in efficiency.

The SYFO CLINOGRAPH is not sold. It is furnished in two standard sizes and may be leased at nominal rates. Many SYFO instruments are already in daily use. In fact SYFO has proved so satisfactory that some producers when writing into their drilling contracts fixed limits from the vertical, use the SYFO test record sheets as evidence before accepting the completed well.

Send for a copy of SYFO CLINOGRAPH Catalogue.

SYFO CLINOGRAPH

SPERRY-SUN WELL SURVEYING CO.

Main Office - 1608 Walnut Street

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STEEL LINE PIPE CASING

SPECIALISTS IN CASING FOR DEEP WELL DRILLING

Chester Steel Casing is famous in the oil fields for its reliability under severe well drilling conditions.

Accurate threading, careful workmanship and safeguarding of the product during every stage of manufacture are excellent reasons why Chester Casing has performed so successfully in all parts of the world. And these same factors are responsible for the high reputation it has enjoyed for the past 30 years.

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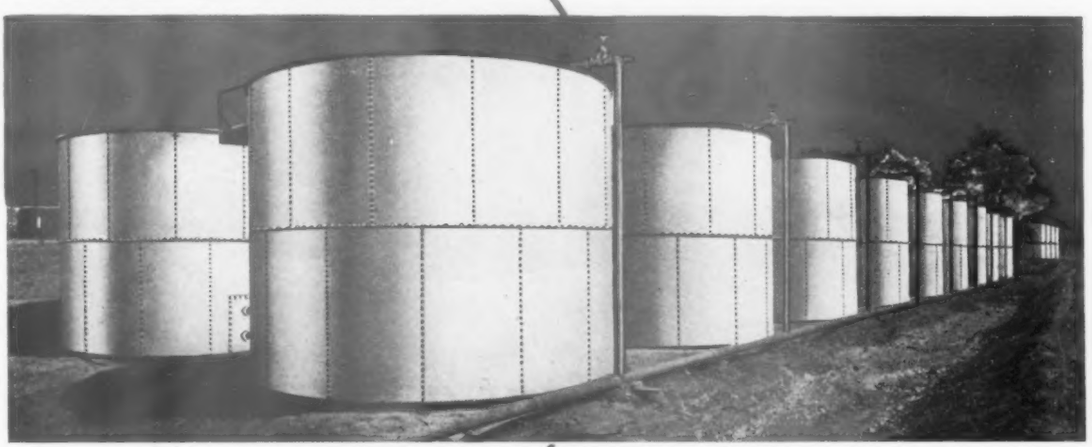
ALUMINUM

IS NOW STANDARD FINISH ON

BUTLER

BOLTED TANKS



THE best is never quite good enough a foundation on which to rest the reputation of Butler Steel products. Constantly Butler engineers are striving, devising and testing for betterment.

The accumulative effect of this constant effort has brought about substantial design and flawless construction in Butler welded and bolted oil field tanks which adapt them extraordinarily well for all oil field, pipe line and many refinery purposes. Even the erection, cutting down and re-erection of bolted tanks are facilitated in the factory through precision forming and punching of interchangeable sections.

Now, new factory methods make possible ALUMINUM as standard finish on Butler Bolted Tanks. The preservative and preventative qualities of this finishing material are made an integral part of Butler value.

Operators who take pride in the appearance and efficiency of their leases naturally choose Butler aluminum finished tanks, cadmium plated stairways and runways and ready-made steel buildings. At the same time they effect economy—the substantial kind which comes from long wear, low maintenance, oil conservation and simplified portability.

Call a Butler field office for dependable day or night erection, cutting down or re-erection service.

• • •

Drane-Humphrey Co., at San Angelo, Ft. Worth, Big Spring, Pyote, Best and McCamey, Texas; and Hobbs, N. M.

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Muskegon Boiler Works, Muskegon, Michigan.

Gulf Coast Tank Company, 1612 Moffit St., Houston, Luling, Refugio, Pettus and Grand Saline, Texas, V. P. Hughes, Prop.

Thomas Moran at Oil City, Shreveport, New Iberia, Lake Charles, Zwolle and Houma, Louisiana.

M. A. Trimmer, at Blackwell and Lovell, Oklahoma.

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BUTLER MANUFACTURING COMPANY

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If You Want a Gate Valve of Sturdiest Construction

select one made of forged steel so you can obtain additional strength without adding to the weight. Forged steel is free from piping, sand holes, porous spots and other flaws hidden in the average castings. Darling Forged Steel Gate Valves have all the splendid features found in other Darling Gate Valves, plus the extra tensile strength of Forged Steel. If you are the least bit uncertain about the strength of your present valves under possible high pressures, equip your lines with Darling Forged Steel Valves. They will give you peace of mind.

DARLING VALVE & MFG. CO.

WILLIAMSPORT, PA.

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Mid-Continent Distributors

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DARLING

GATE VALVES

All These Fields Are Within 5 Days of the J & L Memphis Warehouse

The J & L Memphis warehouse organization is trained to give quickest possible service on all orders. Thus, the railroad schedule to your field represents the time in which J & L can deliver oil country tubular goods and line pipe you order from it's Memphis Warehouse.

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

J&L STEEL

Manufacturers of Seamless and Welded Casing, Tubing, Drill Pipe and Line Pipe, and Welded Steam, Gas and Water Pipe in both Black and Galvanized.

Also makers of Bars, Shapes and Plates, Reinforcing Bars, Cold Finished Steel, Junior Beams, Steel Piling, Fabricated Structural Work, Steel Barges, Wire Products and Tin Mill Products.

JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

American Hammered Piston Rings

Endorsed and used as Factory Equipment by

Ajax Iron Works - - - - Corry, Pa.
Atlas Diesel Co. - - - Oakland, Cal.
Bruce-Macbeth Eng. Co. - Cleveland, Ohio.
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Wilson Snyder Mfg. Co. - Pittsburgh, Pa.
Worthington Pump & Mach. Corp., New York, N. Y.

INNER SEAL RING
Patent No. 1,699,135

The material consists of a uniform, close grained resilient cast iron, free from porosity and blow holes. The rings are individually cast so that the finished rings are free from unequal shrinkage strains, and with the graphitic carbon so distributed and proportioned as to produce an iron giving exceedingly long life to both cylinder liner and ring.

The molding and casting are done in our own up-to-date foundry, where all conditions are under the direct control of our competent metallurgists and foundrymen.

Can be obtained in standard and oversizes from the above companies or their selling agents.

The AMERICAN HAMMERED PISTON RING CO.
BALTIMORE, MD.

World's Largest Manufacturer of HAMMERED Piston Rings

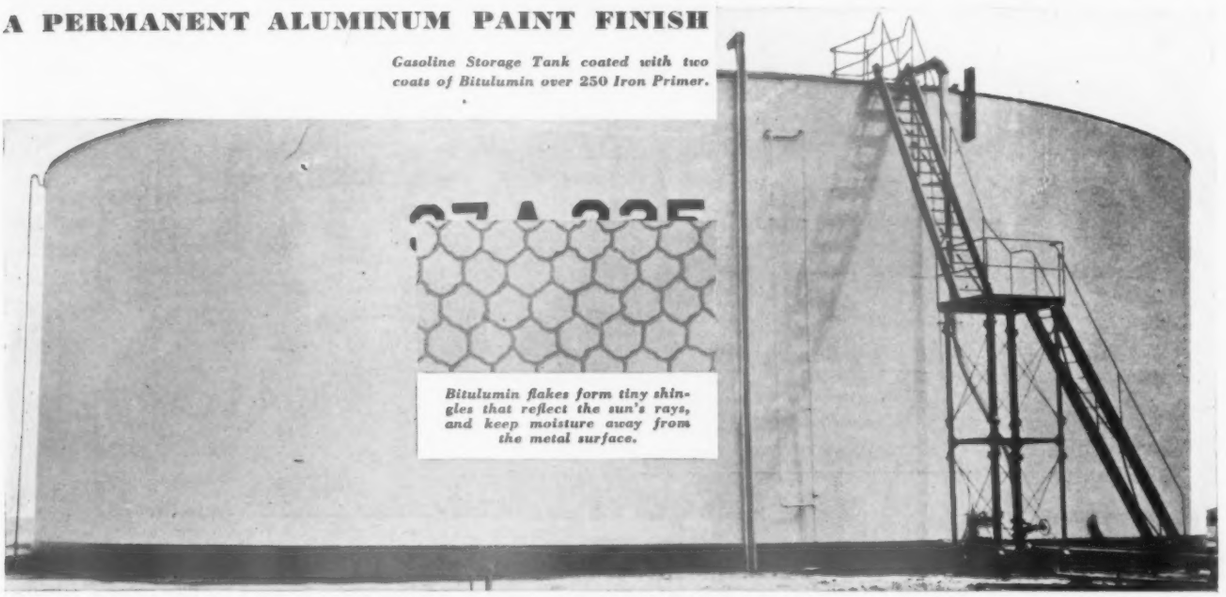
BRANCHES

215 Market St., San Francisco, Cal.
501 Pico St., Long Beach, Cal.
524 Poydras St., New Orleans, La.
7338 Woodward Ave., Detroit, Mich.
800 W. Rio Grande Ave., Fort Worth, Tex.
826 E. First St., Tulsa, Oklahoma
11 Moore St, New York City, N. Y.
148 Pearl St., Boston, Mass.

BITULUMIN

A PERMANENT ALUMINUM PAINT FINISH

Gasoline Storage Tank coated with two coats of Bitulumin over 250 Iron Primer.



Bitulumin flakes form tiny shingles that reflect the sun's rays, and keep moisture away from the metal surface.

SHINGLED WITH ALUMINUM

THE superior weather and sun-resisting qualities of Bitulumin are due largely to the specially developed Vehicle used as the base. This Bitulumin Vehicle is a perfect medium for Aluminum Powder, as it does not "binder-log" the tiny flakes, but permits perfect leafing action by which the minute particles of Aluminum form a metal plate over the whole surface. Under the microscope this aluminum-armored surface looks just like a perfectly shingled roof. Oil, gas and water tanks, tank cars, refinery and field equipment painted with Bitulumin *are* virtually shingled with Aluminum, which defies the evaporating influence of the sun, keeps out moisture, is impervious to acids and fumes and furnishes years of real protection.

Bitulumin is always shipped with the Powder and Vehicle in separate containers, although the special Aluminum Paint Vehicle may be purchased separately. Illustrated literature on request.

GENERAL PAINT CORPORATION

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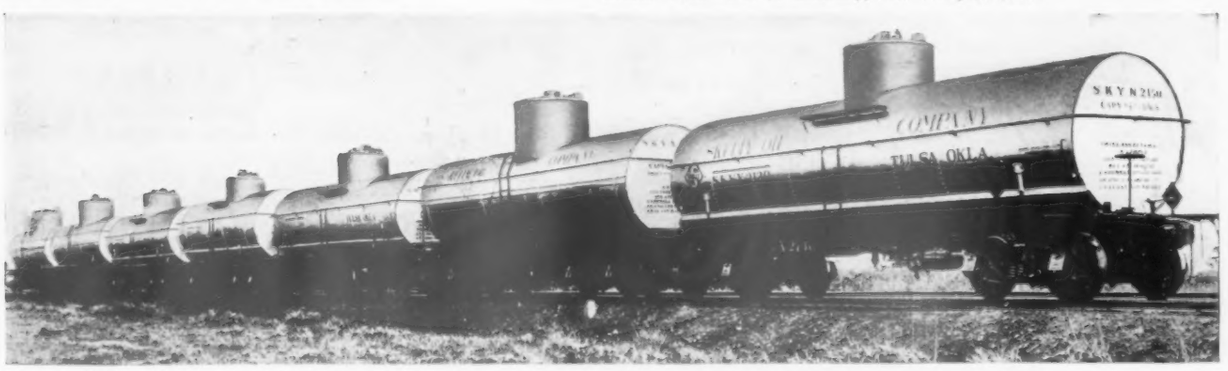
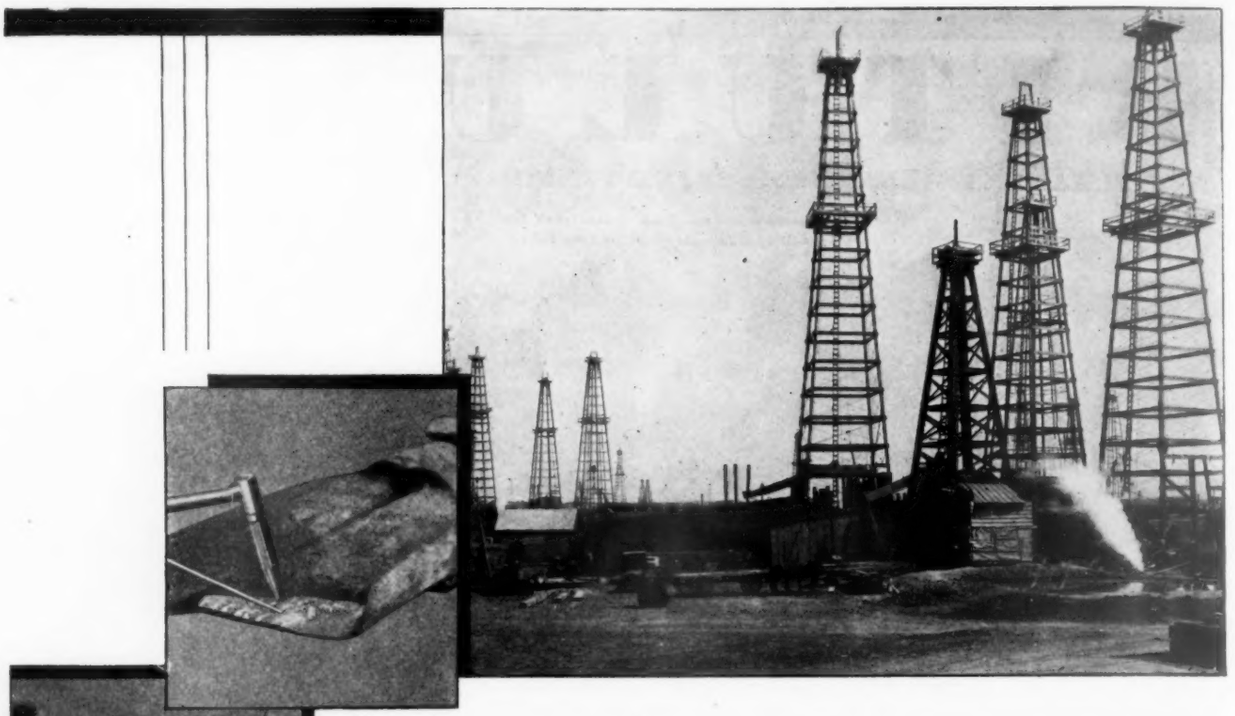
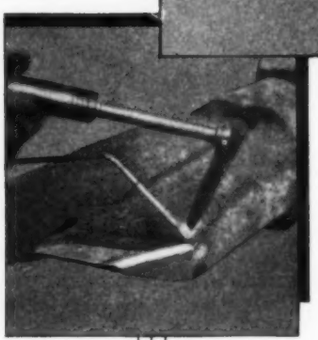
Export Department: *Head Office*—160 Fremont St., San Francisco, Calif., U. S. A.
Branch Office—No. 11 Broadway, New York, U. S. A.



Oil Tank Cars, Skelly Oil Co., coated with one coat of Bitulumin over 250 Iron Primer





CONSIDER THE SAVING WITH HAYSTELLITE . . . *A Haynes Stellite Product*

An operator from the Midway-Sunset field of California reports he saved $130.60 on tool cost alone for 2600 feet drilled. But consider the total saving when it took less than half the usual number of tools to drill this footage — eliminating twelve "round trips."

As a test the operator drilled two offset wells — one with tools hard set with Haystellite and hard faced with Haynes Stellite, and the other with another diamond substitute and another type of hard facing material. Surface pipe was set to the same depth in each hole and the footage per bit was recorded.

WELL NO. 1	OFFSET WELL NO. 2
Material used — Haystellite and Haynes Stellite.	Material used — Other Diamond Substitute and other Hard Facing.
Depth drilled — From surface pipe to 2600 feet.	Depth drilled — From surface pipe to 2600 feet.
Number of tools — 8.	Number of tools — 20.

Write for our new book "Haynes Stellite Products in the Oil Fields." Fill out and return the coupon today.

HAYSTELLITE TRADE MARK

HAYNES STELLITE TRADE MARK

Haynes Stellite Company, Kokomo, Ind.

Without obligation on my part, please send me your new book, "Haynes Stellite Products in the Oil Fields."

Name.....

Company.....Position.....

Street Address.....

City.....State.....

HAYNES STELLITE COMPANY

Unit of Union Carbide UCC *and Carbon Corporation*

CHICAGO DETROIT LOS ANGELES SAN FRANCISCO
CLEVELAND HOUSTON NEW YORK TULSA

General Offices and Works—Kokomo, Indiana

Haynes Stellite Welding Rod is also available from any of the 42 shipping points of the Oxweld Acetylene Company

HAYNES STELLITE · HAYSTELLITE · HASCROME · HASTELLOY

Quality Products, Fair Prices, Dependable Supply, Engineering Service

Quality Has No Substitute
SKELLY

Quality Has No Substitute
SKELLY

ONE OF SIX

The New TAGOLENE Motor Oil is one of six major products of an organization which always places "how good" ahead of "how much"

SKELLY

Under the Skelly Banner of Quality

SKELLY AROMAX GASOLINE

SKELLY Refractionated GASOLINE

SKELLY AERODYNAMIC GASOLINE

Under the Skelly Banner of Quality

THE NEW TAGOLENE MOTOR OIL

SKELLY AIRPLANE OIL

SKELGAS
A COMPRESSED GASEOUS NATURAL GAS

REFINERY
EL DORADO, KANS.

SKELLY OIL COMPANY
TULSA, OKLAHOMA

BRANCH OFFICES
KANSAS CITY
OMAHA
MINNEAPOLIS

MADE TO ESTABLISHED STANDARDS

Bethlehem maintains at Houston, Texas, and Wilmington, Calif., well assorted stocks of line pipe, ready for immediate shipment. Both threaded and coupled and plain-end pipe are included in these stocks.

Careful workmanship and high-grade material go into the manufacture of Bethlehem Steel Pipe. Each step in its production is carried out under the supervision of men thoroughly experienced in pipe manufacture. Strength, uniformity, ductility, sound welds, clean, smooth surfaces, freedom from flaws—these qualities are assured by care in manufacture and by tests and inspections far more rigid than standards require.

In addition to these features the purchaser of Bethlehem Steel Pipe is assured of a product that conforms in every respect to a definite and long-established standard of quality—the standard to which this company has been working throughout more than half a century devoted to the manufacture of steel and steel products.

The nearest Bethlehem District Office will gladly give you further information about Bethlehem Steel Pipe. Your inquiry or order will receive immediate attention.

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Buffalo, Pittsburgh, Cleveland, Cincinnati, Detroit, Chicago, St. Louis

Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco, Los Angeles, Seattle, Portland, Honolulu.

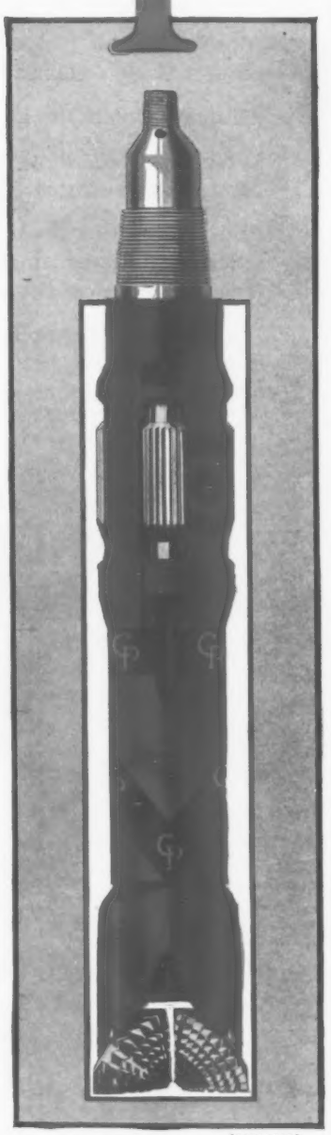
Export Distributor: Bethlehem Steel Export Corportion, 25 Broadway, New York City.

BETHLEHEM STEEL PIPE

With the NEW CP "Tucone" ROCK BIT

9 POINTS OF SUPERIORITY

1. SAFETY—Extra large drop-forged spindle bearings. No cone bushings. One-piece bit head. One-piece reamer body. FISHING ELIMINATED
2. CIRCULATION—Fluid stream jets directly on bottom of hole. No side-wall hydraulicking. STRAIGHT HOLE
3. CLEARANCE—Over 34% of hole area is clear. "Balling up" eliminated. STRAIGHT HOLE
4. CONES AND SPINDLE BEARINGS—Cones run on extra large replaceable drop-forged spindle bearings. Stronger and thicker cone wall section due to absence of bushing. GREATER STRENGTH
5. REAMERS—Three units, properly spaced and located for accurate reaming. New type reamer bearing eliminates wear on reamer body. KEEPS GAUGE — ALWAYS!
6. ONE-PIECE BODIES—Both bit and reamer bodies are solid manganese steel. GREATER STRENGTH
7. REPLACEMENTS—Cone-and-bearing units and reamers easily and quickly changed. TIME SAVED
8. LOW MAINTENANCE—Body repairs eliminated. No wear on bit head or reamer body. MONEY SAVED
9. CONE SERVICE—New CP "Red Head" cutting cones can be refitted on your used bearings (only at authorized CP Service Stations) and guaranteed by CP to be as good as if a new bearing were used—at a great saving to you! ECONOMY



(PATENTED)

THREE REAMER CUTTERS

Properly spaced and located for accurate reaming. New type reamer bearing eliminates wear on body.

KEEPS GAUGE—ALWAYS!

Three separate reamer cutters are placed at the proper distance for best alignment and efficient reaming. The reamer cutters rotate on a bearing held in the reamer body by a bearing pin. Thus, any wear caused by the reaming action falls on the reamer cutters and the bearings—there is no wear on the reamer body itself, therefore, NO LOSS OF GAUGE!

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: Chicago Pneumatic Bldg., 6 East 44th St., New York

OIL TOOL DIVISION OFFICES:

OKLAHOMA CITY, OKLA. 655 Santa Fe Ave., LOS ANGELES, CAL.

KEEPS GAUGE ...ALWAYS! OT-15

That the use of CP "Tucone" Rock Bits will unquestionably result in lower drilling costs, we are ready and willing to prove in any way YOU say! An inquiry to any of the above addresses will receive immediate attention.

"Here, Lad—

I've just been talking to that man you sent in from Lincoln Electric Company.

He certainly is a crank on the subject of arc welding. How does he get that way?"

"Easy, Pop—

He's an *intimate* of my friend here, 'Arc Welding'.

Fact is every man in the Lincoln organization is a similar 'crank' and for very good reason.

During working hours everyone from the 'card please' boy at the front door to the welder bouncer on the shipping platform, all they see is arc welding.

All they *read* is matter on arc welding.

All they *study* is arc welding.

All they *hear* at company meetings or in business conduct is arc welding.

All they *teach* at the Lincoln school is arc welding.

When they *talk* shop it must be on arc welding because that's all that happens in the shop.

And because they're that kind of 'cranks' due to strict specialization, more is naturally expected of their welders than if their production was varied.

It's significant to note, Pop, that 87% of the statues in the world have been erected to men who were once called 'cranks' on specialized subjects."

TRADITION

PROGRESS

The Lincoln "Stable-Arc" Welder

— welds easier
— makes better welds
— permits greater output because of the steady uniform arc throughout entire welding range, which is the result of:

- **Variable voltage design**
- **Laminated magnetic circuit**
- **Separately-excited generator field**
- **Double control of welding heat**
- **All steel construction**

No other welder has all these features.

The Lincoln Electric Co., Dept. No., 33-8 Cleveland, O.

W-152

LINCOLN "Stable-Arc" WELDER

Building » »

Oil Field Equipment Has Been Our Business

For Forty Years ◆ ◆ ◆

WHERE dependability must be absolute . . . where the standard of construction must meet the highest requirements . . . where good practical design must combine with utility to assure good service . . . oil men everywhere specify ALTEN'S with confidence.

A close association with the varied and exacting problems, which oil men have been encountering for the past forty years, has given us an expert knowledge and experience. Our specialization in oil field equipment has permitted us to embody skillful design, expert craftsmanship and perfect quality in every Alten product.

Today there are over a hundred time-tried and field-tested items to help in the better production of oil. And we also build to order where necessity demands. Our engineers will prepare blueprints and specifications based upon your sketches, without obligation.

Ask Your Supply House, or Write Us.

ALTEN'S
Foundry & Machine Works

Established 1889 **LANCASTER, OHIO**

DRILLERS *are demanding* BALDWIN

ROTARY Rig Operators are demanding Baldwin Precision Oil Well Chain because it doesn't shake loose and is practically free from pitch elongation. Long ago Baldwin found that drilling put such tremendous loads on chain that a special oil well chain was developed to eliminate the faults that previously caused expensive shut-downs and premature wear.

Baldwin Precision Oil Well Chain has *straight side bar construction,* which concentrates the chain wear where it belongs —between the pin and the bushing, and the bushing and the roll. This minimizes pitch elongation.

Baldwin Straight Side Bars are accurately machined, and Baldwin Rollers and Bushings are ground to size after hardening. Thus the uneven stresses which cause the round parts to work loose in the link holes are minimized. Baldwin special alloy steels and heat treatments give an elasticity which takes up the stresses of sudden starting so destructive to chain life. Positive lubrication is assured by two oil holes in each bushing.

Rotary Rig manufacturers use Baldwin Chain. Experienced field men demand it because it keeps down drilling costs. It is easy and convenient to get. The distributors listed below carry quantities in stock all the time.

BALDWIN-DUCKWORTH CHAIN CORPORATION

Baldwin Division

WORCESTER MASSACHUSETTS

This is how Baldwin 1240 S (A.P.I. No. 4) looks. It tests 140,000 lbs.

Baldwin 1030 S (A.P.I. No. 3) looks the same and tests 66,000 lbs.

DISTRIBUTORS:

Geo. J. Fix Company, 2507 Commerce St., Dallas, Texas

J. W. Minder Company, 927-929 Santa Fe Ave., Los Angeles, Calif.

The Petroleum Equipment Co., 2800 So. Alameda St., Los Angeles, Calif.

The Adam-Hill Company, 244 Ninth Street, San Francisco, Calif.

Lucey Products Corp. of Tulsa, Healdton and Duncan

International Supply Company at Okmulgee, Wewoka and Stroud

T. T. Word Supply Co., Houston, Beaumont, Texas Shreveport and Lake Charles, La.

Grover C. Johnson, Wichita Falls, Pyote and Big Springs, Texas

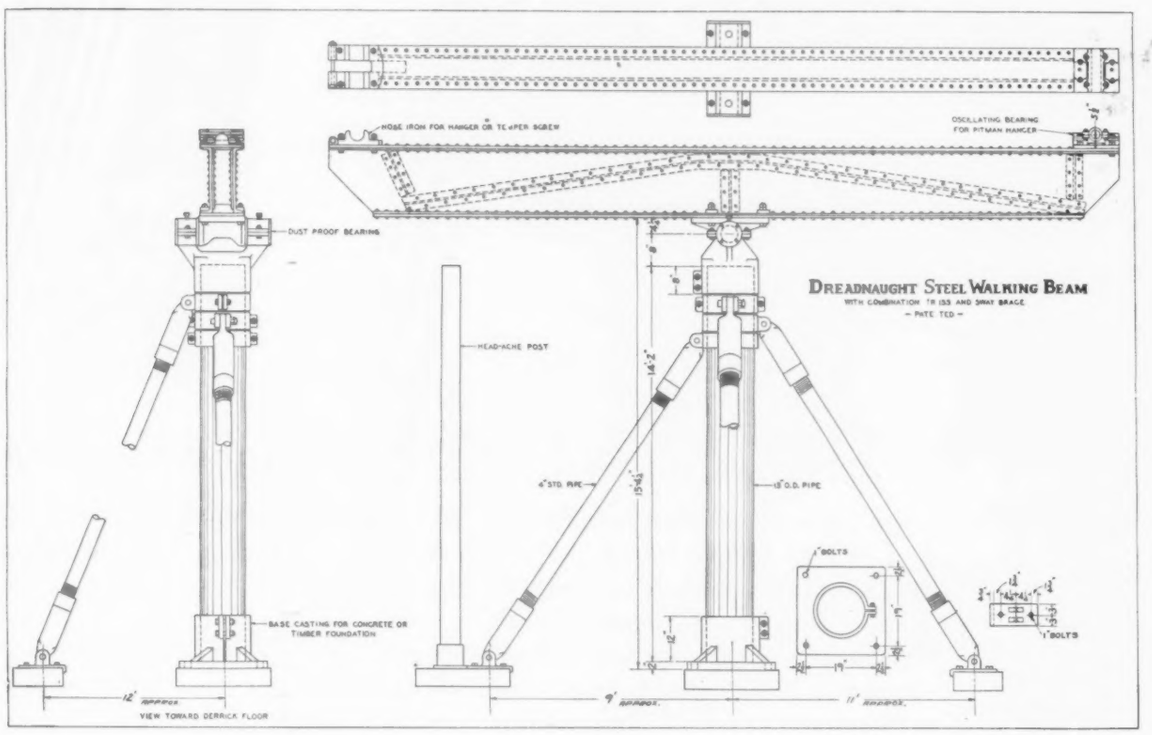
Hercules Supply Company, Fort Worth, Pettus, Refugio, Texas; Hobbs, New Mexico

Export Department: W. S. FELLOWS, 33 Cortlandt St., New York City

BALDWIN DUCKWORTH

Detail Drawing

of interest to users of Walking Beams For Drilling or Pumping


NOSE IRON FOR HANGER OR TEMPER SCREW
OSCILLATING BEARING FOR PITMAN HANGER
DUST PROOF BEARING
DREADNAUGHT STEEL WALKING BEAM
WITH COMBINATION TRUSS AND SWAY BRACE
— PATENTED —
HEAD-ACHE POST
4" STD. PIPE
15" O.D. PIPE
BASE CASTING FOR CONCRETE OR TIMBER FOUNDATION
VIEW TOWARD DERRICK FLOOR

The DREADNAUGHT Patented Steel Beam was designed to carry modern deep operating loads found in many fields. It is a Beam of super-strength with a safety factor appreciated by users. The Internal Truss Brace construction eliminates side sway—leaves top and sides clear for movable counterweights—gives a beam with 100% recovery value and one that is practically indestructible.

Drawing also shows DREADNAUGHT Tubular Sampson Post and Adjustable Tubular Sampson Post Braces.

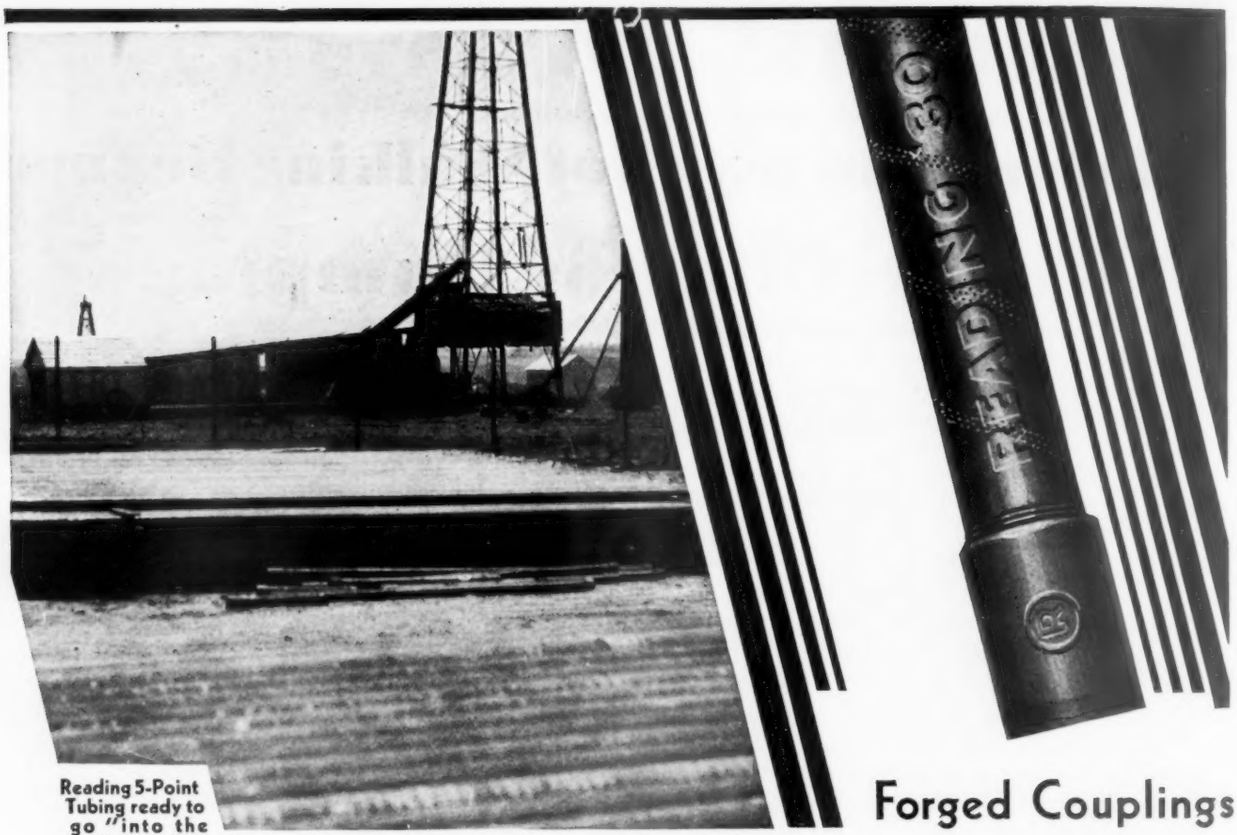
Complete details on request. Sold by your Dealer:
at Frick-Reid Stores or Direct.

BEAUMONT IRON WORKS COMPANY

MANUFACTURERS OF DREADNAUGHT EQUIPMENT

WE FAVOR THE STANDARDIZATION PROGRAM OF THE AMERICAN PETROLEUM INSTITUTE

BEAUMONT, TEXAS, U. S. A.



Reading 5-Point Tubing ready to go "into the hole" in Peabody District, Kansas.

Forged Couplings

Just Another Advantage of Reading 5-Point Tubing!

It's easy to understand why Reading Galvanized 5-Point Tubing has gained such wide acceptance in the oil country. All couplings, for example, are forged—not rolled—and the threads are galvanized, too! And when you remember that Reading 5-Point Tubing inherently resists corrosion—that it will not crystallize—and that it holds galvanizing several times more thickly than other ferrous tubing materials—you have a combination that's hard to beat!

All Reading 5-Point Tubing, Casing, and Line Pipe are made of the original, Genuine Puddled Wrought Iron, tested in the toughest fields by generations of use. You'll protect yourself from substitutes by looking for the Reading name and indented spiral mark on every length of Reading 5-Point Pipe.

As an added improvement, all Reading Galvanized Couplings for Reading 5-Point Tubing are now furnished with galvanized threads.

* * *

Reading pipe distributed by:
Frick-Reid Supply Corp.
Bradford Supply Co.
Republic Supply Co.
Superior Tube Co.
Our own stocks at Houston, Texas

READING IRON COMPANY
Reading, Pennsylvania

Atlanta . Baltimore . Cleveland . New York . Philadelphia . Boston
Cincinnati . St. Louis . Chicago . New Orleans . Buffalo . Houston . Tulsa
Seattle . San Francisco . Detroit . Pittsburgh . Los Angeles . Kansas City

GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM ⅛ TO 20 INCHES

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron

OTHER BREWSTER PRODUCTS

Include A. P. I. Shouldered Tool Joints; Perfection Core Barrels; Chrome Nickel Drill Collars; Special Fish Tail and Gumbo Bits; Core Barrel Cutter Heads for both hard and soft formations—hard formation cutter heads are faced with a substance of diamond-like hardness.

Straight hole drilling . . . . . is like Bull's Eye Shooting . . easy..with the right kind of tools!

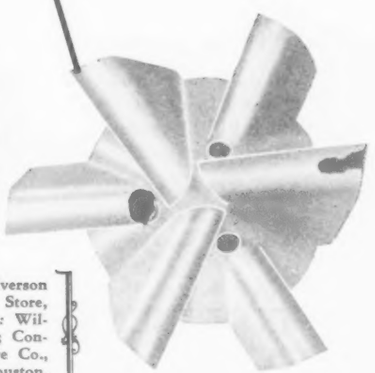
Ask any one of the hundreds of operators who recommend the Brewster Straight Hole, hard or soft formation bit, why they use it. They will tell you they look upon it as a definite guarantee of a straight hole.

The Name "BREWSTER"

—is a definite guarantee of performance plus.

Pat. Pend. No. 438,542

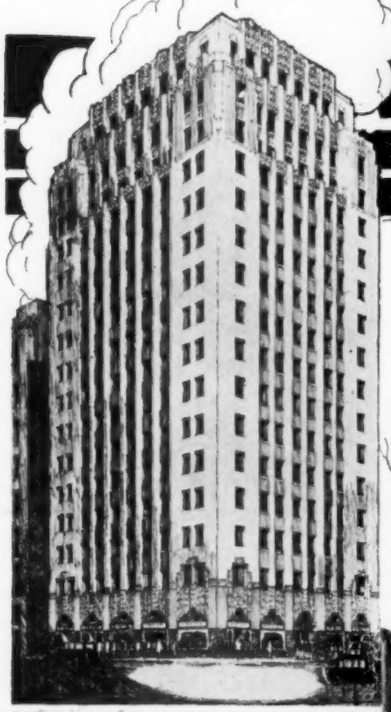
The Brewster COMPANY~INC.
SUCCESSORS TO OIL CITY IRON WORKS, INC.
Shreveport, Louisiana



COMPLETE STOCK carried at these warehouses: Iverson Specialty Co., Oklahoma City, phone 2-2833; Houston Store, 2000 Harrington St., phone Capitol 3021. *Distributors:* Wilson Supply Co., Houston, Beaumont and Luling, Texas; Continental Supply Co., all stores; Murray-Brooks Hardware Co., Lake Charles, Louisiana; T. T. Word Supply Co., Houston, Texas, and Lake Charles, Louisiana; El Dorado Foundry, Machine & Supply Co., El Dorado, Arkansas. *Exclusive Export Agents:* W-K-M Co., New York City.

A NEW FIELD
IN TERMS OF MODERN OFFICE STRUCTURES

THESE THREE NEW BEAUTIES NOW ALMOST COMPLETED IN FT. WORTH



THE DULANEY BUILDING

THE FAIR BUILDING

THE AVIATION BUILDING

Ample Banking Facilities

Combined resources all Fort Worth banks December 31, 1929—

$99,508,982.91

IN STEP with the great strides in public utility and industrial expansion in Fort Worth is the construction program of office and commercial buildings.

Geographically located in the heart of America's greatest oil producing zone, Fort Worth is the logical transportation and business center for oil companies and all allied industries.

Already more than six hundred firms engaged in oil or oil machinery business are officed in Fort Worth and additional modern office buildings are being rushed to completion to handle the constantly increasing demand for accommodations.

The Oil and Gas Bureau of the Fort Worth Chamber of Commerce will be glad to answer any inquiries from those interested in Fort Worth as an executive, distributing or manufacturing point.

The banks sponsoring this page will be glad to cooperate with any firm interested in locating in Fort Worth.

CONTINENTAL NATIONAL BANK
Fort Worth, Texas

FIRST NATIONAL BANK
Fort Worth, Texas

FORT WORTH NATIONAL BANK
Fort Worth, Texas

A Man Made Screening *his Life Study*

THE LAYNE

Milled Groove SCREEN, Resulted

M. E. LAYNE, made screening his life study, and dating farther than a quarter century ago he was identified with the business of solving screening problems.

Through ingenuity and inherent knowledge of oil production conditions—and after more than a quarter century's development—the "greater production" *Layne Milled Groove Screen* was produced.

And, today, this exclusive invention is used by leading oil companies abroad and in this country. Upon its inception its acceptance was sensational.

The *Layne Milled Groove Screen* increases production from 33-1/3% to 100%, has the ability to safely stand 8,000 feet of drill pipe, avoids sand cutting, and does not clog with mud or sand.

Install the *Layne Milled Groove Screen* instead of wishing you had.

Write, wire or phone for quick service, prices, or catalogue.

The Layne & Bowler Co.

Houston THE LAYNE Texas

Increases Production

The Layne New York Co., 30 Church St., New York
The Layne & Bowler Corp., Los Angeles, Calif.
Vickers, Limited, London, England

A QUARTER CENTURY OF EXPERIENCE AND DEVELOPMENT

OXWELDING FOR PERMANENCE

A LEADING pipe line superintendent says: "We keep our welders busy all the time. When not putting in new lines, which are, of course, all welded, we are digging up old style lines and welding them. Our welded lines are the only ones that are permanently leak-proof."

Oxwelding has won the confidence of oil and gas line operators everywhere because, once tested, oxwelded lines need no further inspection. Oxwelded joints are stronger than the pipe itself.

THE LINDE AIR PRODUCTS COMPANY, THE PREST-O-LITE COMPANY, INC.
OXWELD ACETYLENE COMPANY, UNION CARBIDE SALES COMPANY,

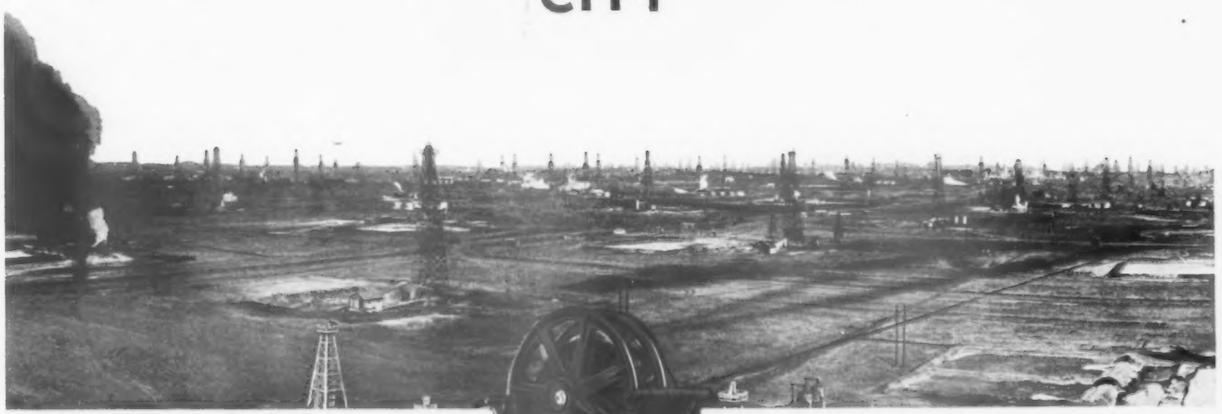
Units of UNION CARBIDE AND CARBON CORPORATION

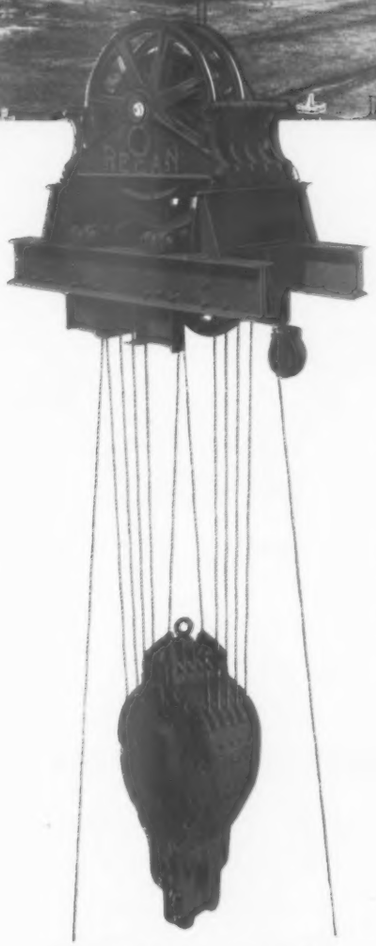
General Offices . . . . . New York UCC **Sales Offices . . . in the Principal Cities**

65 Linde plants . . . 48 Prest-O-Lite plants . . . 174 Oxygen Warehouse stocks . . . 156 Acetylene Warehouse stocks
42 Apparatus Warehouse stocks . . . 245 Union Carbide Warehouse stocks

Regan TOPS THE FIELD!

OKLAHOMA CITY





Type 3B 5-sheave Traveling Block with Type B 6-sheave Crown Block

QUESTION

Why do Regan crown & traveling blocks dominate in the Oklahoma City Field?

ANSWER

Because the majority of Drillers will have only the best equipment . . . . . *they know it pays*

Regan
Forge & Engineering Co.
Oil Field Equipment
Plant and General Offices:
SAN PEDRO (Los Angeles Harbor) CALIFORNIA, U. S. A.

New York Office:
75 West Street, Wm. Braat, Manager
Mid-Continent Office:
Dallas, Texas, 501-2 Marvin Building
Representatives:
Oklahoma City, Okla., 2420 W. 21st St.
Pecos, Texas, P. O. Box 444
Maracaibo, Venezuela, Wm. Adams, care American Consul

DONOVAN BOILERS

are Consistently Good

and BUILT for their Purpose

A product should be made to suit the intended use and the DONOVAN boiler is. We believe that, to meet the average oil-field operating conditions, a boiler should be made as simple in design as possible.

Accordingly, the DONOVAN is built from a thoroughly tried design. Nothing is added to it and no detail is changed until its worth is proved beyond question. Each change when made is in the direction of greater efficiency and more damage-proof construction.

It is our honest desire to build the best there is. This has been our goal since our establishment years ago, and our product today embodies features not found on any other make.

Quality BOILERS *since* 1890

DONOVAN BOILER WORKS, INC.

PARKERSBURG, W. VA.

NEW YORK OFFICE—30 Church Street

Mid-Continent and Eastern Distributors

FRICK - REID SUPPLY CORPORATION

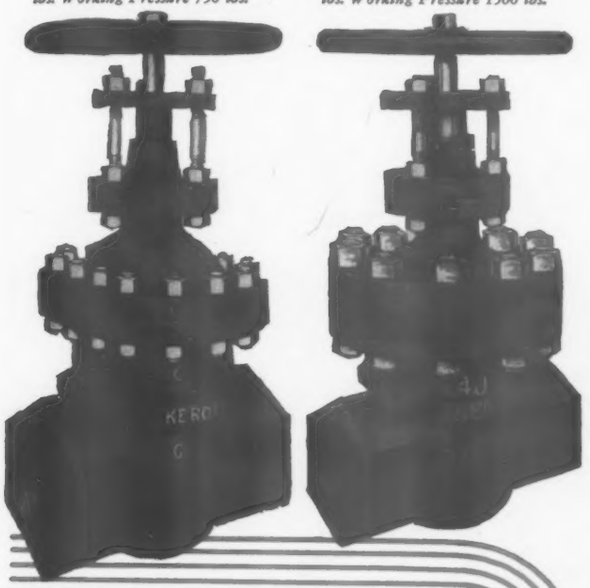
Montana Distributors

GREAT NORTHERN TOOL & SUPPLY CO.

MIDLAND IRON WORKS

TYPE "H"
FLOW LINE VALVES
All pipe sizes up to 8". Screwed or Flanged Ends. Test Pressure 1500 lbs. Working Pressure 750 lbs.

TYPE "J"
FLOW LINE VALVES
All pipe sizes up to 8". Screwed or Flanged Ends. Test Pressure 3000 lbs. Working Pressure 1500 lbs.



FLOW LINE
KEROTEST
VALVES

TYPE "K" FLOW LINE VALVES
All pipe sizes up to 8". Screwed or Flanged Ends. Test Pressure 2000 lbs. Working Pressure 1000 lbs.

TYPE "X" FLOW LINE VALVES
All pipe sizes up to 8". Screwed or Flanged Ends. Test Pressure 1000 lbs. Working Pressure 500 lbs.

TYPE "F"
FLOW LINE VALVES
All pipe sizes up to 8". Screwed or Flanged Ends. Test Pressure 6000 lbs. Working Pressure 3000 lbs.

The fact that Kerotest Line Valves and Fittings have beer adopted as standard equipment by many of the world's largest oil producers constitutes its own recommendation to you as a user of valves and fittings.

Whatever size, weight, type or dimension, you may require, there's a Kerotest valve or fitting to meet your most critical and exacting requirement.

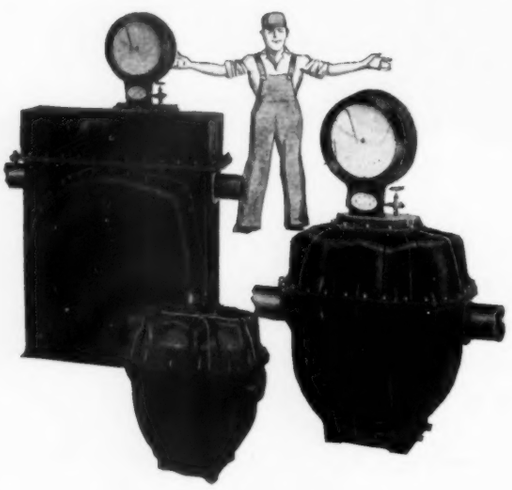
KEROTEST MANUFACTURING COMPANY
PITTSBURGH, PA.

Carried in Stock and Sold by NORVELL-WILDER SUPPLY COMPANY
Houston Beaumont Shreveport Fort Worth

OIL WELL SUPPLY COMPANY
Branch Stores in all Oil Fields

Export Distributors: OIL WELL SUPPLY COMPANY
Pittsburgh New York Tampico London

THE ONLY COMPLETE LINE OF METERS AND REGULATORS



WHERE THE CONSUMPTION IS LARGE— EMCOS

EMCO Large Capacity Meters, whether sizes 2½, 3, 4 or 5, are built for the jobs they have to do. The rugged case construction assures safety. They require a minimum amount of your consumer's valuable floor space. Manifold installations are easily made and are compact. If repairs or inspections are necessary, make them while the meter is in the line. They are accurate.

EMCO PRINCIPLES

Rolling Type Diaphragm · Diaphragm Drains
Case Construction—Rugged Beyond Compare
Moving Parts Easily Accessible
Repair Them in the Line

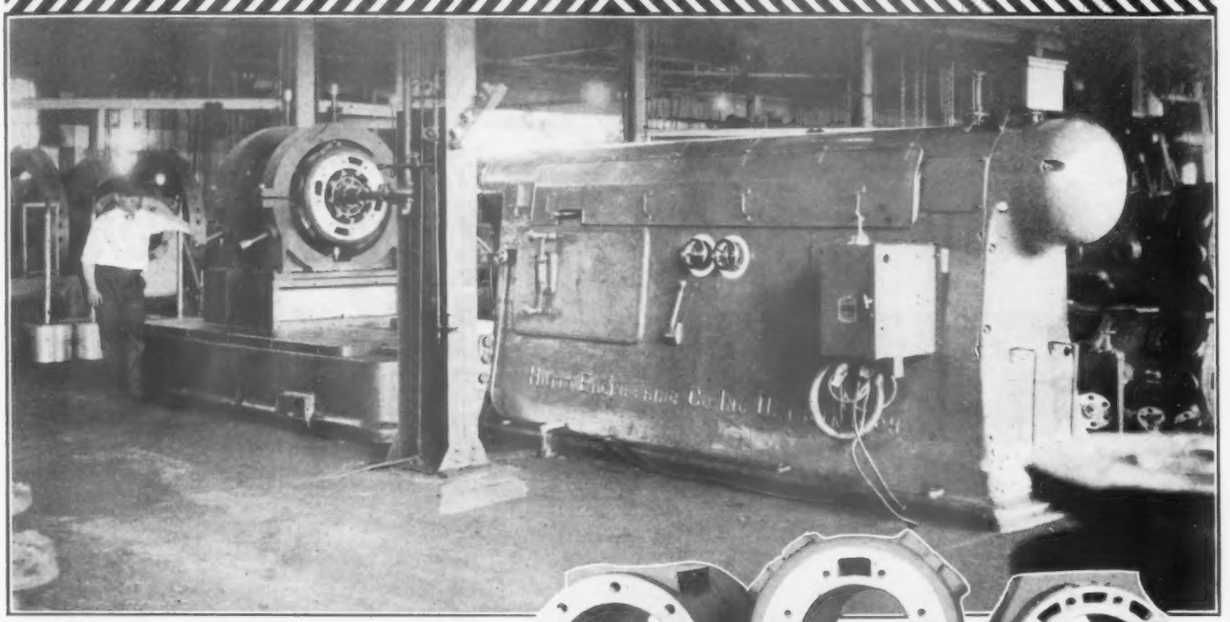
EMCO METERS AND REGULATORS

PITTSBURGH EQUITABLE METER COMPANY

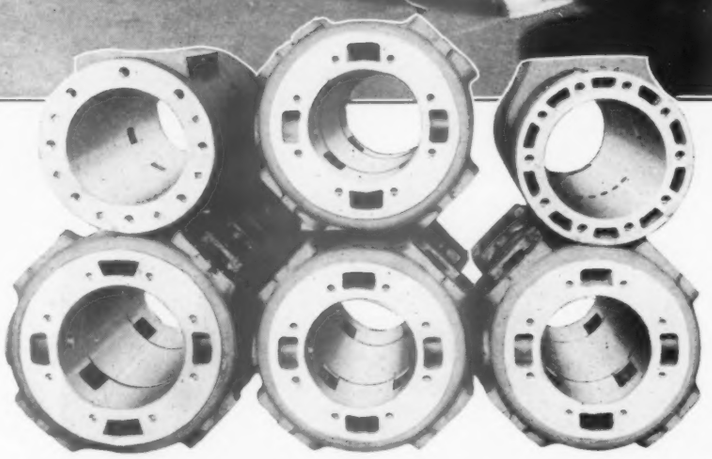
Main Office and Works—Pittsburgh, Pa.

New York City · Chicago, Ill. · Los Angeles, Calif. · Tulsa, Okla. · Dallas, Texas · Columbia, S. C. · Salt Lake City · Kansas City, Mo. · Seattle, Wash. · Houston, Texas

Another CLARK Improvement



CYLINDER BORES ARE HONED TO A SMOOTH, MIRROR-LIKE SURFACE



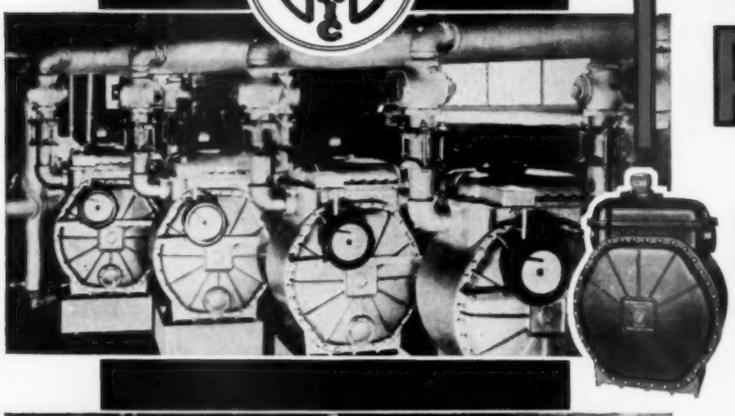
Above is shown a huge cylinder honing machine in operation in the CLARK plant. Below are shown cylinders after honing.

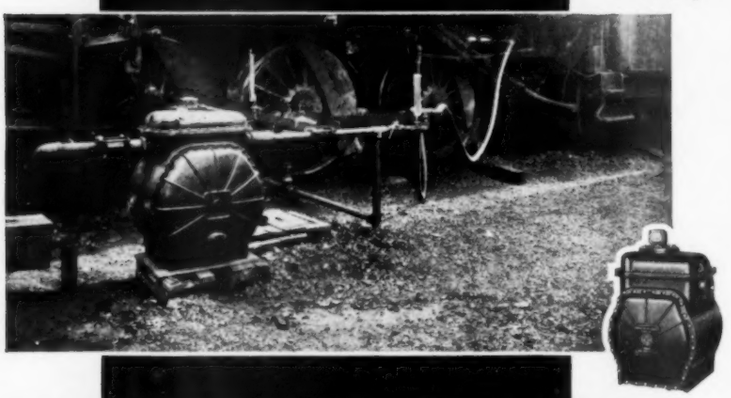
Buyers of CLARK Engines and Compressors now profit by another CLARK improvement—a honing process which puts a smooth, mirror-like surface on the bore of both power and compressor cylinders. Piston rings take a perfect fit with surprising quickness. Most of the first year's wear is eliminated . . . For more than 50 years Clark Bros. Company have given customers the benefit of every development which could improve the efficiency and economy of CLARK machines.

CLARK

CLARK BROS. COMPANY
Olean, New York

Export Office: 150 Broadway, New York City. Mid-Continent Sales Offices: Tulsa and Fort Worth. Warehouses: Tulsa; McCamey and Sweetwater, Texas; Artesia, New Mexico. California: Smith, Booth, Usher Company, 228 South Central Ave., Los Angeles.





Fundamental Reliability

—that will BUILD your "Industrial" Sales

The appearance of Metric Iron Case Meters, in itself, wins the confidence of customers. Sturdiness, attractive lines, compactness . . . even the users of gas, who are unfamiliar with the scientific principles underlying gas meter construction, can appreciate these qualities.

But within the case . . . what? Although the customer may be impressed by the outside view, a Gas Company knows that meters must have a superior inside mechanism as well, if true records of gas consumption are to be obtained. It is precisely on this basis that Metric Iron Case Meters have established their reputation. They protect and satisfy both consumer and Gas Company by an operating precision and a sturdiness of construction that effectively meet modern demands for accuracy, flexibility, long life and attractive appearance.

A more highly developed part . . . a more advanced design . . . or an improved operation have, time after time, been introduced during the march of Iron Case Meter progress. Metric's work with Iron Case Meters has been dominantly conspicuous.

Metric developments . . . having run continuously since pioneering days . . . are the foundation of the gas engineer's confidence in the thorough reliability of Metric Iron Case Meters. Their up-to-date operating accuracy has won new friends, new customers, new business. To invest in Metric Meters is to invest wisely in the building of profitable industrial sales.

Write to headquarters of Gas Measurement Engineering for complete data on Metric Iron Case Meters

METRIC METAL WORKS
ERIE, PENNSYLVANIA
Ironcase, Tinned Steel Case and Orifice Meters

AMERICAN METER COMPANY
INCORPORATED
The World's Largest Manufacturers of Gas Meters and Allied Apparatus
Established 1836

Sales and Service: Erie · Dallas · Tulsa · Denver · Los Angeles · San Francisco · Kansas City · Pittsburgh · Chicago · Philadelphia · New York · Baltimore · Boston · Albany

A MECHANICALLY PERFECT PIPE

PERFECTLY WELDED
PERFECTLY ROUND..
UNIFORM THICKNESS
SCALE & OXIDE FREE

REPUBLIC
ELECTRIC WELD
PIPE

MADE BY A NEW PROCESS
CONTROLLED EXCLUSIVELY BY
REPUBLIC STEEL CORPORATION
YOUNGSTOWN . OHIO .....

A NEW PROCESS GUARANTEES THIS MECHANICALLY PERFECT PIPE

The mechanical perfection of Republic Electric Weld Pipe is due in large measure to the very simplicity of the method employed in making it.

High grade open hearth steel skelp — a simple cold shaping — a momentary contact with two huge electrodes — complete fusion at the weld — finished pipe.

Examine a length. Try to find the weld. Note the perfect roundness. Feel how smooth it is — how free from scale and oxide. "Mike" the wall thickness — anywhere. And you can't help saying — "This is the pipe for which we have been waiting."

REPUBLIC STEEL CORPORATION
YOUNGSTOWN, OHIO

REPUBLIC
ELECTRIC WELD
PIPE

FOUR MORE Texas Statistics

New Jobs Taken Over by 1930 Apparatus

STATISTICS in Texas are already so big they give us a headache, but we feel obliged to add a few more startling items concerning a certain invisible heat that comes from the middle of the earth:

1. There are 549 cities and towns in Texas that run with natural gas . . . for *Heat*, for *Cold*, for *Manufacturing*. Twenty years ago there were only five or six.

2. Our own Lone Star system of field lines has grown to more than 3500 miles in Texas and Oklahoma, and smoke is practically obsolete on all of our skylines.

3. It is so rich and inexpensive (1,000 B.t.u.'s per cubic foot) that the people get spotless, automatic heat for millions of dollars less per year than ordinary heat would cost.

4. Modern gas equipment, for the home as well as for industry, is remarkably efficient and economical, and has taken over several new jobs around the place, as the pictures below will demonstrate.

A Gas Refrigerator runs without machinery. No noise. No intermittent cycle. CONSTANT cold for a few cents a day, that keeps a shelf temperature below 50 degrees.

FLOOR FURNACES.

About the size of a steamer trunk, and swings beneath the floor. Extremely economical in operation. The gas flame is vented out of doors.

The modern gas range keeps its heat INSIDE the oven, behind the insulated walls. Oven regulator as accurate and selective as a radio dial. And some of the ranges can cook with the gas turned off.

GAS INCINERATORS.

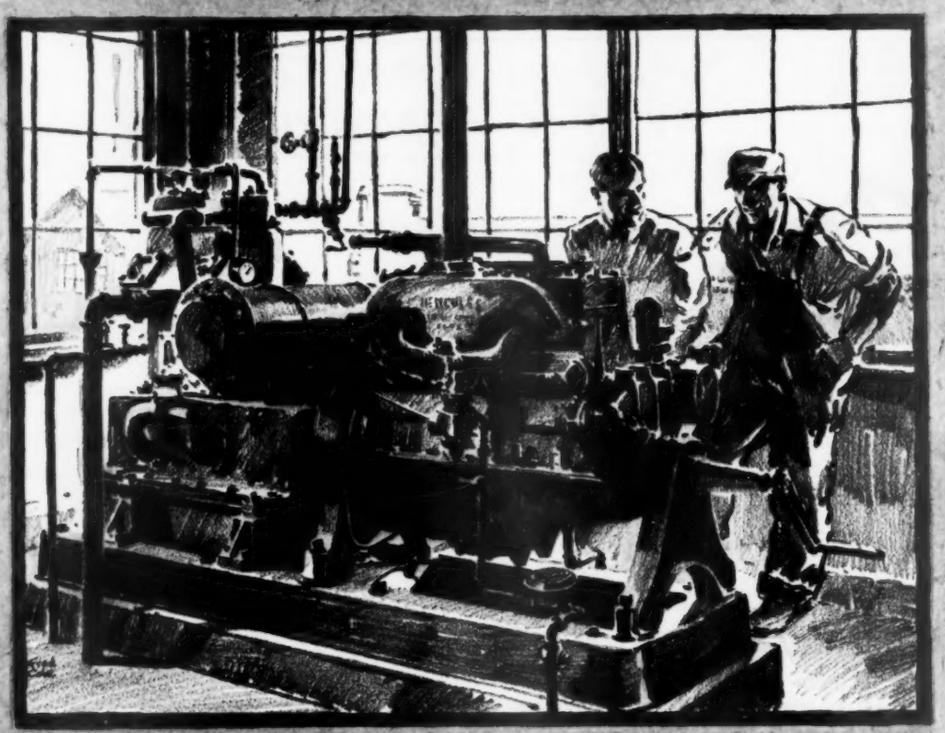
Garbage and trash vanish on the spot. Fast, sanitary destruction.

LONE STAR GAS COMPANY

Producers and Transporters of Natural Gas

DALLAS

HERCULES ENGINES



Hercules Engines are advanced in engineering, simple and compact in design, dependable and economical in operation. In the grueling, heavy-duty service of the oil lands—either as inbuilt parts of specialized equipment, or as independent power-units—their reputation is unsurpassed. Throughout the heavy-duty power field it is acknowledged that Hercules Engines provide the utmost in sheer engine value.

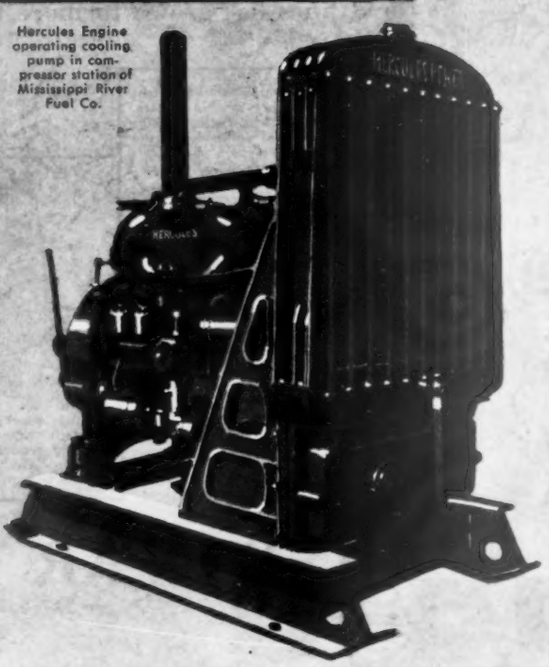
HERCULES MOTORS CORPORATION
Canton, Ohio, U. S. A.

West Coast Branch: San Francisco, Cal.
Mid-Continent Branch: Tulsa, Okla.

Distributors: Smith-Booth-Usher Co., Los Angeles, Cal.; Edward R. Bacon, San Francisco, Cal.; F. C. Richmond Machinery Co., Salt Lake City, Utah; Worthington Machinery Corp. of Oklahoma, Tulsa, Okla.; Nervell-Wilder Supply Co., Beaumont, Tex.; Bovaird & Co., Bradford, Pa.

European Distributor: Automotive Products Co., London, Berlin, Vienna.

Hercules Engine operating cooling pump in compressor station of Mississippi River Fuel Co.



NOTICE!

Drilling Contractors

Letters have gone out from our headquarters to every drilling contractor we have on our list, asking you to fill out a "listing sheet" showing the names of your key men to whom you would like us to send, free of charge, a copy of the 1930 Edition Composite Catalog of Oilfield and Pipe Line Equipment.

This Composite Catalog will contain complete descriptive matter on several hundred pieces of new, standard, or improved oilfield specialties; the complete A.P.I. Standardization Specifications, both the descriptive matter and specifications being so indexed as to permit the user to find immediately just what he is looking for.

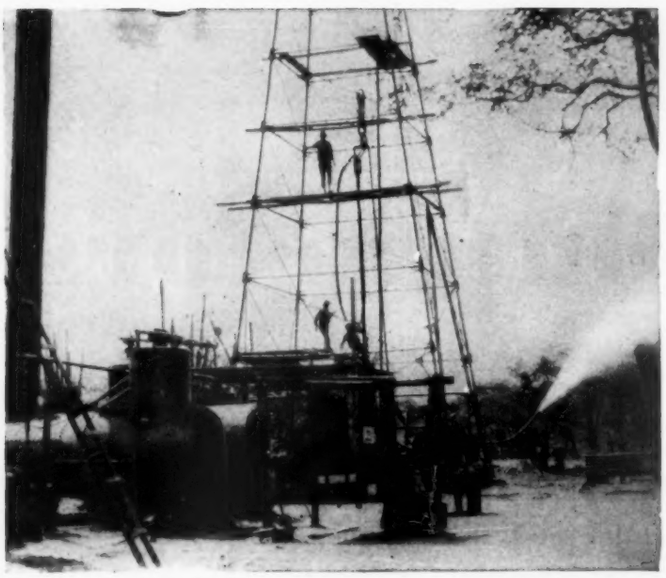
It will run in excess of 500 pages in size, and will prove extremely valuable to a drilling contractor or oil man.

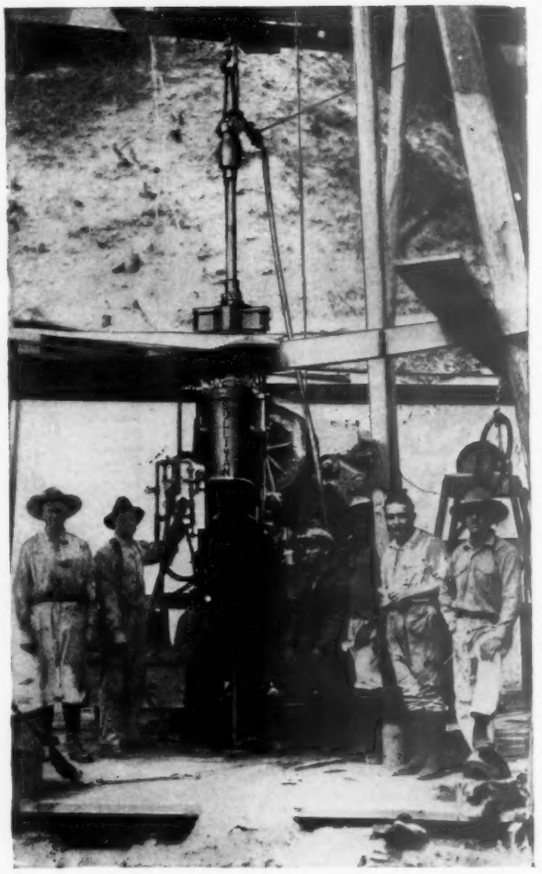
If you have not filled out the listing sheet sent you, please do so immediately.

The Gulf Publishing Company

Composite Catalog Division

HOUSTON, TEXAS





Above: Sullivan "60" Core Drill in Venezuela. In one month and twenty-six days, the user set 200 feet of 16-inch casing; 1,000 feet of 11¾-in.; 2,495 feet of 8⅝-in. and 4,050 feet of 6⅝-in. At Right: Sullivan structure core drill in Argentina. One of these drills has established a record of 25,610 feet, and 60 moves in six months.

CORE DRILLING cuts the cost of Oil Exploration in every field

Rich leases—quick spotting of the favorable "highs"—test wells at 15 to 20 per cent of the cost of other drilling methods. Those are the things Sullivan Core Drills have given to shrewd oil men all over the world.

CHEAPER TO CORE DRILL THAN PAY RENT

In many places core drilling has prevented losses in holding doubtful leases. For core drilling tells you quickly whether favorable structure is present, or not.

CORE DRILLING PICKS THE LIKELY SPOTS

Once promising structure is found, and the oil is wanted, geologists establish the likely spots for wells quickly, with structure core drills.

A Sullivan core drill reveals the exact elevation of the key bed at various points so that trends can be defined and favorable "highs" charted.

TEST WELLS FOR LESS

When the favorable spots are determined, a Sullivan Core Drill will make the deep test and obtain core, for 15 to 20 per cent less than other methods—as the hole is smaller, and the time, labor, and equipment costs are reduced.

Hard or soft material is drilled rapidly, as encountered, with no change in equipment. And the thousands of dollars saved on the dry holes easily pay the cost of redrilling when a strike is made.

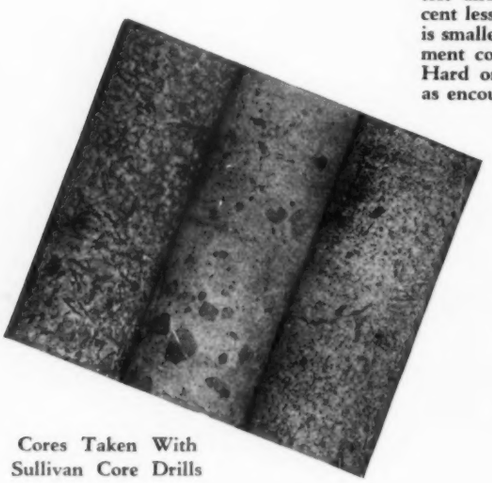
SULLIVAN CORE DRILLS IN EVERY OIL FIELD

Sullivan Core Drills have reduced the cost of oil exploration in Roumania, Russia, Persia, Algeria, India, Portuguese East Africa, Santo Domingo, Venezuela, Peru, Colombia, Ecuador, Argentina, Mexico, Canada, and in all oil fields of the United States.

NEW PICTORIAL BOOKLETS NOW AVAILABLE

New Sullivan Booklets, containing interesting illustrations and sample cost figures on Structure Testing, and Deep Hole Drilling, will be mailed free on request. Ask for

85-K Structure Testing
85-H Deep Tests and Wildcatting



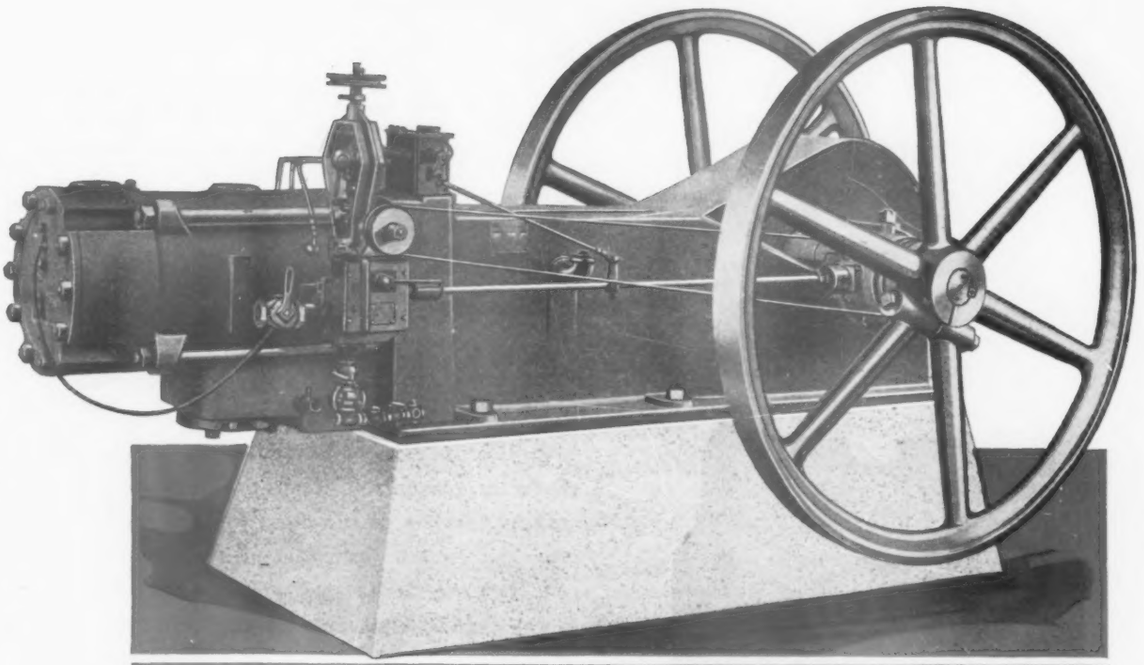
Cores Taken With Sullivan Core Drills

SULLIVAN CORE DRILLS

SULLIVAN MACHINERY COMPANY

713 Wrigley Bldg., Chicago

Agent for Oklahoma and Kansas: Geo. E. Failing, Enid, Okla.



FRANKLIN VALVELESS O.G. PUMPING ENGINE

This engine can solve most of your power problems

Pick out a tough power problem and then select the right size of a Franklin Valveless Gas Engine to solve the problem—and the problem will remain solved through a long, long period of years. Ruggedness, simplicity, economy, longevity are all combined in this fine piece of machinery that invites your critical examination. Give the Franklin Valveless Gas Engine a chance on the tough power problem—give it a chance to prove its merits.

Franklin Valveless Engine Company

Franklin, Pennsylvania

Distributed by

OIL WELL SUPPLY CO.

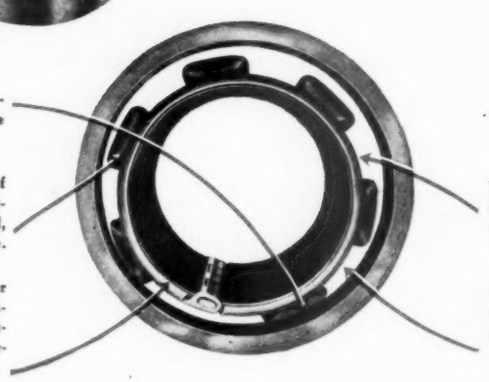
EMSCO
Free-Circulation PROTECTORS

Getting down to basic facts, here are the

Reasons for EMSCO Supremacy

Full protection with minimum wear—that's the reason for Emsco supremacy. A careful analysis of the chart clearly shows why the Emsco protector protects better, renders more satisfactory service, and wears longer than it is possible for any other type of protective appliance to do. It explains why Emsco protectors actually last from four to ten times longer and yet do not restrict circulation—two very good reasons why oil men who know prefer them above all others.

Write us for illustrated folder which gives all the facts in detail.



Only one of the tough rubber bumpers can come in full contact with the casing at one and the some time.

Beveled edges plus the small area of contact, further aided by the lubricating effect of the circulating mud, make friction absolutely impossible.

The body of the rubber protector provides the basic strength to withstand shocks and strains *without increasing surface area of contact between protector and casing.*

Tough rubber bumpers widely separated make air pockets impossible, eliminating friction on the non-skid principle.

Unrestricted circulation — area of clear space, by actual measure, is greater than the total volume of fluid forced through rotary hose.

E. M. SMITH COMPANY

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Available for steel, wrought iron, cast iron and spiral weld pipe—all sizes from ¾" up—for all working pressures. See Sweet's Page 451. Mail the coupon below.

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"For every joint on every line"

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For uses, installations, specifications and prices, fill in and mail this coupon.

VICTAULIC COMPANY OF AMERICA
26 Broadway New York

Please send me VICTAULIC BULLETIN No. ?

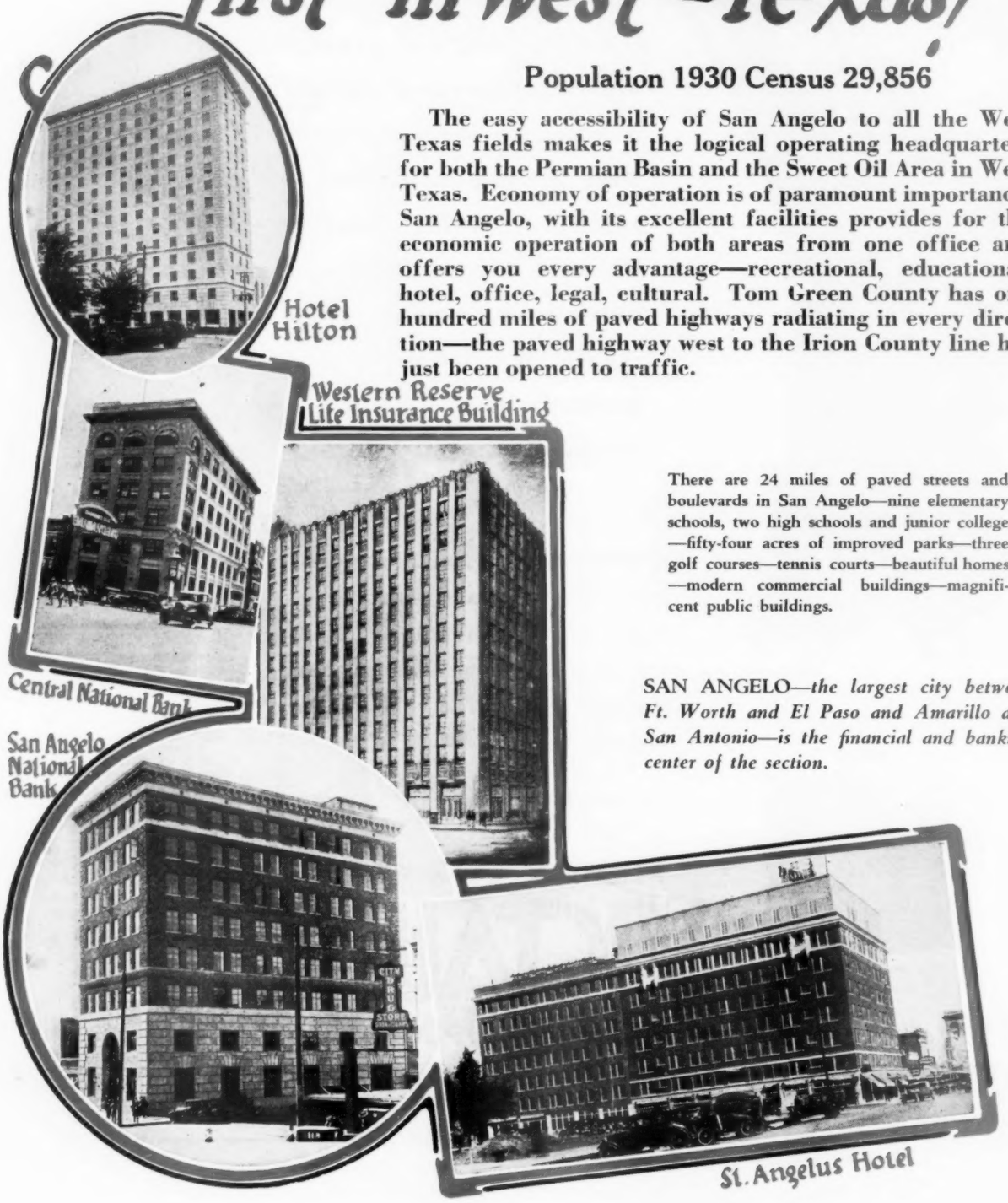
Name_____

Address_____

San Angelo, *first in West Texas!*

Population 1930 Census 29,856

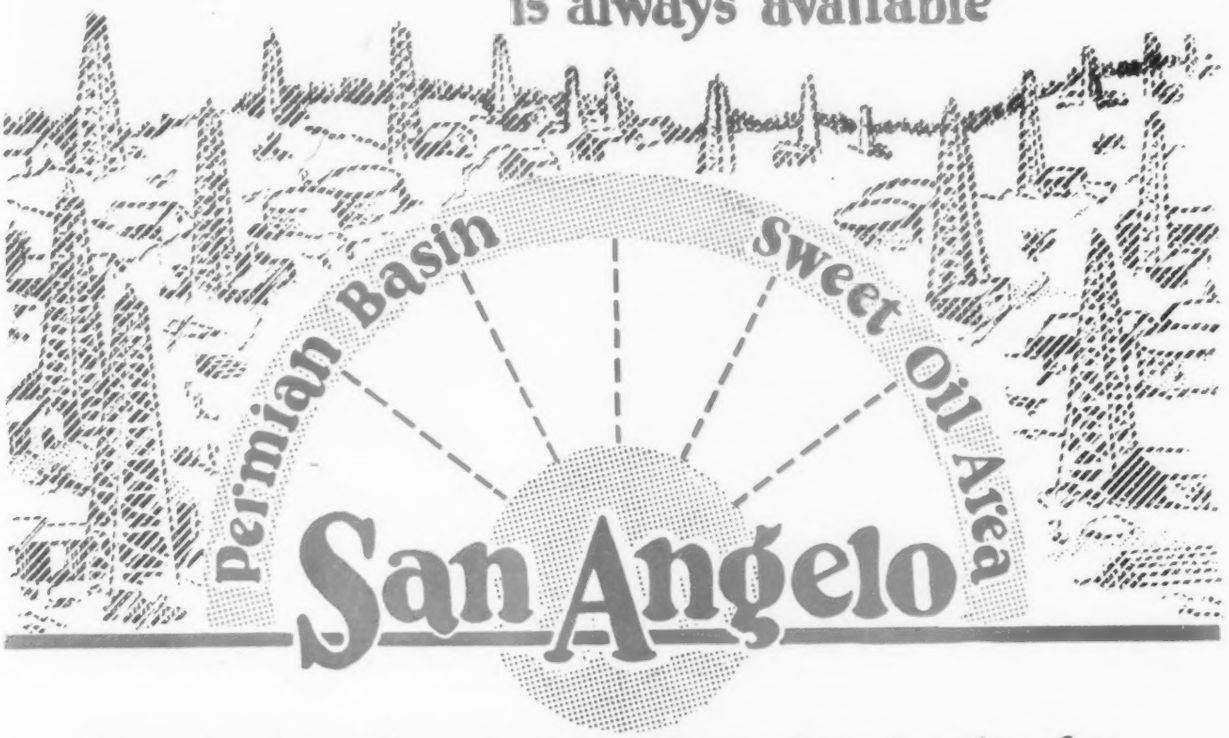
The easy accessibility of San Angelo to all the West Texas fields makes it the logical operating headquarters for both the Permian Basin and the Sweet Oil Area in West Texas. Economy of operation is of paramount importance. San Angelo, with its excellent facilities provides for the economic operation of both areas from one office and offers you every advantage—recreational, educational, hotel, office, legal, cultural. Tom Green County has one hundred miles of paved highways radiating in every direction—the paved highway west to the Irion County line has just been opened to traffic.



There are 24 miles of paved streets and boulevards in San Angelo—nine elementary schools, two high schools and junior college—fifty-four acres of improved parks—three golf courses—tennis courts—beautiful homes—modern commercial buildings—magnificent public buildings.

SAN ANGELO—*the largest city between Ft. Worth and El Paso and Amarillo and San Antonio—is the financial and banking center of the section.*

The Only City in Texas where RELIABLE Oil Information is always available



Operating headquarters for both the West Texas Permian Basin and Sweet Oil Area

The West Texas fields comprise 17 producing counties—2626 producing wells with an average daily production in excess of 300,000 barrels of oil. The Permian Basin has the world's deepest producing oil well, the world's largest producing well, and the world's most shallow production.

One-eighth of all the oil produced daily in the United States is produced in the West Texas fields. The daily average potential of the Yates field alone is over twice the daily production of the entire United States.

The BOARD *of* CITY DEVELOPMENT

SAN ANGELO, TEXAS

IDEAL
TRAVELING BLOCK

76 INCH TYPE C

42-INCH DIAMETER SHEAVES WITH A.P.I. GROUND GROOVES, ROLLER BEARINGS, 8¾-INCH CENTER PIN, BUILT-IN GUARD, ALL STEEL CONSTRUCTION, 9000 POUNDS WEIGHT.

Descriptive Bulletin
No. 92
Sent on Request

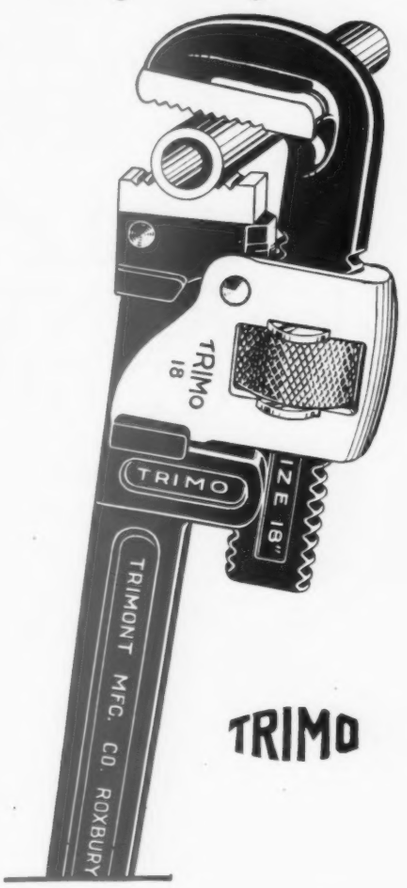
THE
NATIONAL SUPPLY
COMPANIES

The Answer: more value for you

THE MAKERS OF TRIMO wrenches employ a staff of mechanical experts to test and inspect every wrench that bears the TRIMO name. Theirs is a problem of multiplication. By rigorously guarding against imperfections and inaccuracies they multiply the strength, service and safety of this finely made tool.

When you multiply the length of service, naturally you divide the real cost of the wrench. Any way you look at it, it is simple arithmetic that the all-steel TRIMO pipe wrench gives you the biggest dollar's worth.

Oil men who really pay attention to what their tools deliver in the way of performance regard TRIMO as the logical choice.



TRIMO
Pipe Wrench

Handle Drop Forged --- not Cast
All Steel for Strength

TRIMO

Made by Trimont Mfg. Co., Inc., Roxbury (Boston), Mass.

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COASTAL AND PARAFFINE CRUDES
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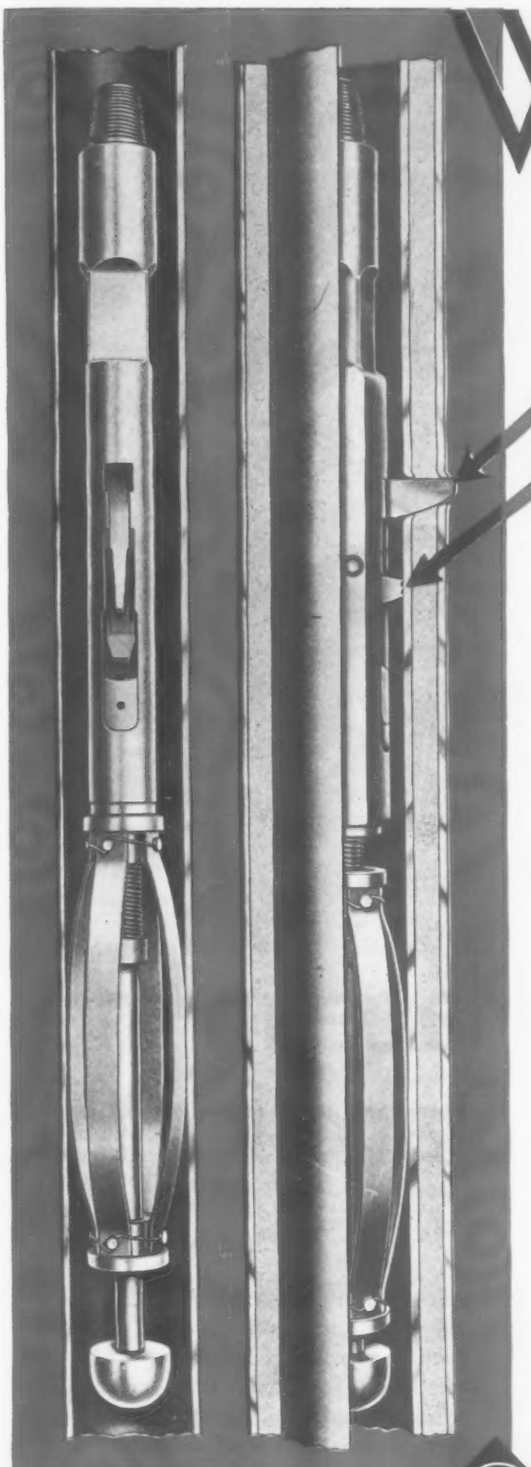
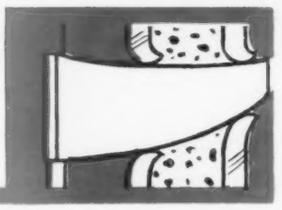


WITH *this*



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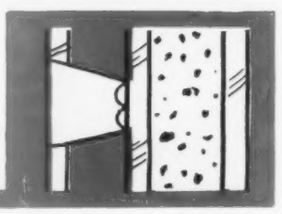

» » » » BAASH-ROSS conquers the almost impossible task of perforating TWO strings of casing or a single string of casing backed with cement.

IT CAN BE DONE WITH A

BAASH-ROSS

LONG KNIFE PERFORATOR

AGAIN and again . . . the BAASH-ROSS Double String Finger Punch Perforator has performed the impossible! In every instance when this tool has been used, perforating has been accomplished with greater rapidity and consequent economy. Facts and data describing actual operations are available.

Note (illustration) the two knives . . . the shorter gripping the inner casing, while the extra long knife forces its way through two strings of casings or one string and cement. Because of the positive action of the knives . . . a good hole on every down stroke of the tool is certain. Knives are furnished in different sizes according to order.

BAASH-ROSS Long Knife Perforators are operated exclusively by BAASH-ROSS operators who have long records of successfully performing the most difficult perforating jobs. They are available upon demand. Sold outright only outside of U. S. A.

J&L PIPE B-R

BAASH-ROSS TOOL COMPANY
Box 1297 Arcade Station, Los Angeles, California

Send Bulletin 77—no charge—describing Baash-Ross Long Knife Perforator.

*Name*_____

*Company*_____

*Address*_____

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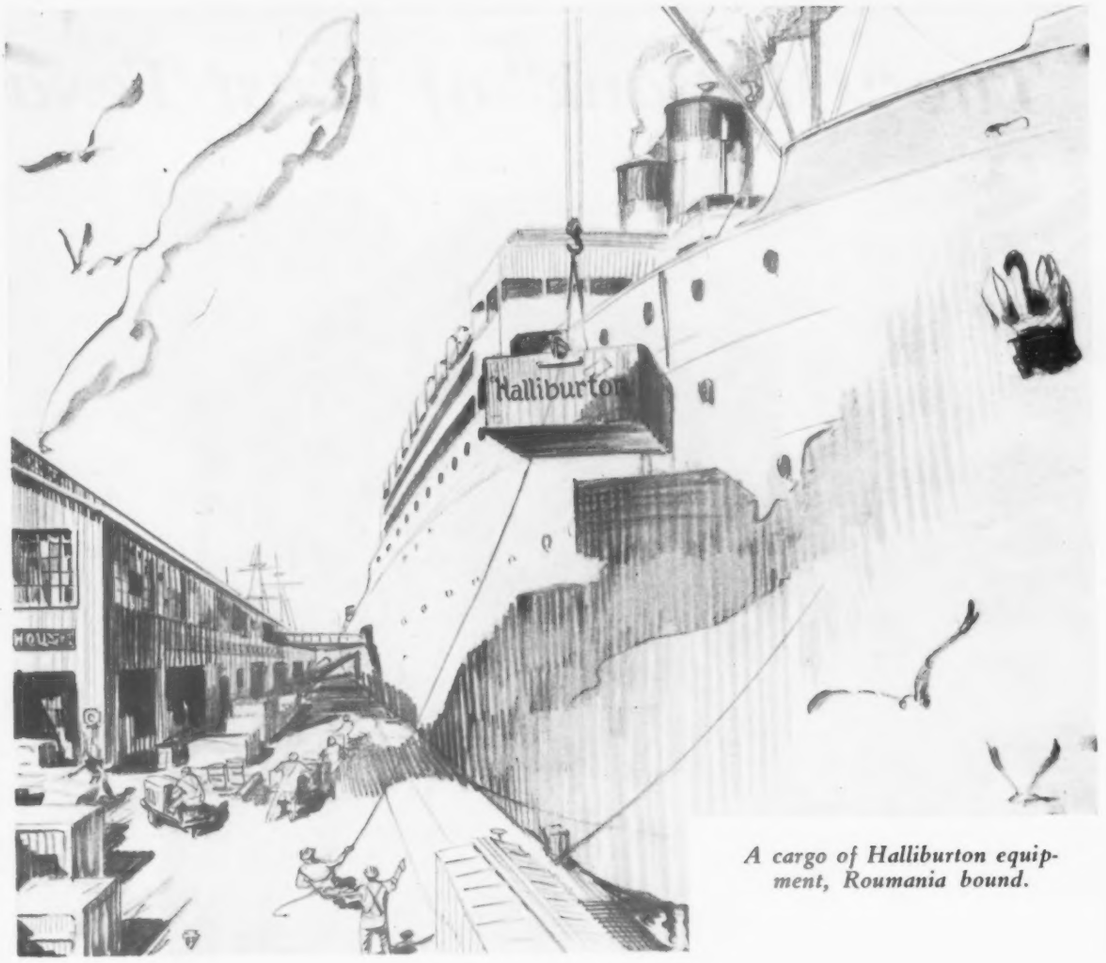
Come where everything that's new and important in methods and machinery for the petroleum industry will be demonstrated for your instruction at one time and place. Attend the great international market of petroleum equipment and take a post-graduate course in YOUR branch of the industry. Five great buildings and many acres of open air space devoted to Scientific and Technical, Producing, Refining, Transporting and Marketing divisions.

Make reservations now. For any information address Wm. B. Way, Gen. Mgr., International Petroleum Exposition, Tulsa, Okla., U. S. A.



A cargo of Halliburton equipment, Roumania bound.

Each year an increasing amount of Halliburton equipment finds its way aboard giant liners for transport overseas.

Foreign oil men—alert to American progress—go thousands of miles and willingly assume high transportation costs, for the same type of cementing service rendered by Halliburton in domestic fields 365 days a year.

HALLIBURTON
OIL WELL CEMENTING CO.
Duncan, Oklahoma

If you will sign and return the coupon, we will send you copies of THE CEMENTER as we issue them. News and views of the industry mailed, without cost to all who are interested.

Halliburton Oil Well Cementing Co.
Dept. OW, Duncan, Okla.

Without cost or obligation, please place my name on the list to receive THE CEMENTER regularly as issued.

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Company .....

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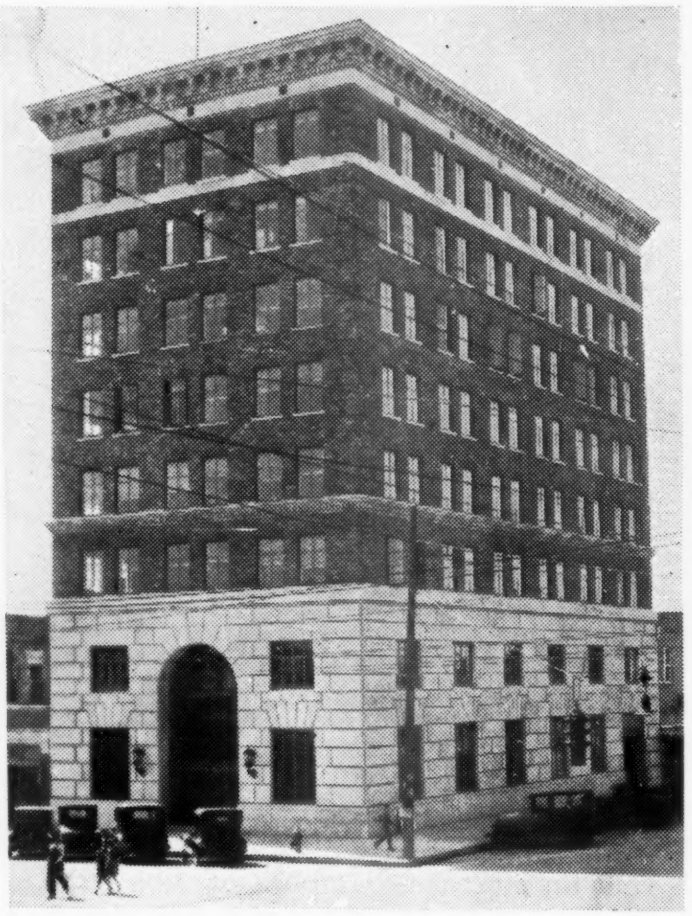
The "Oil Bank" of West Texas!



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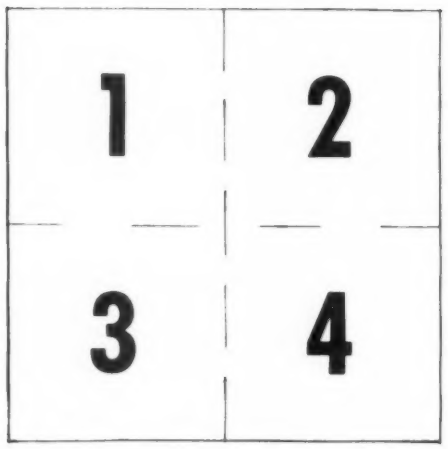

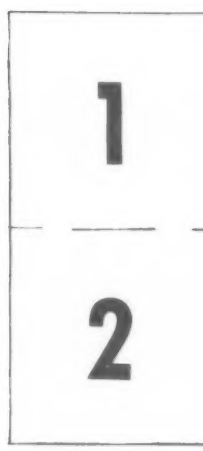

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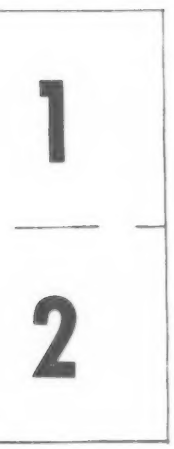

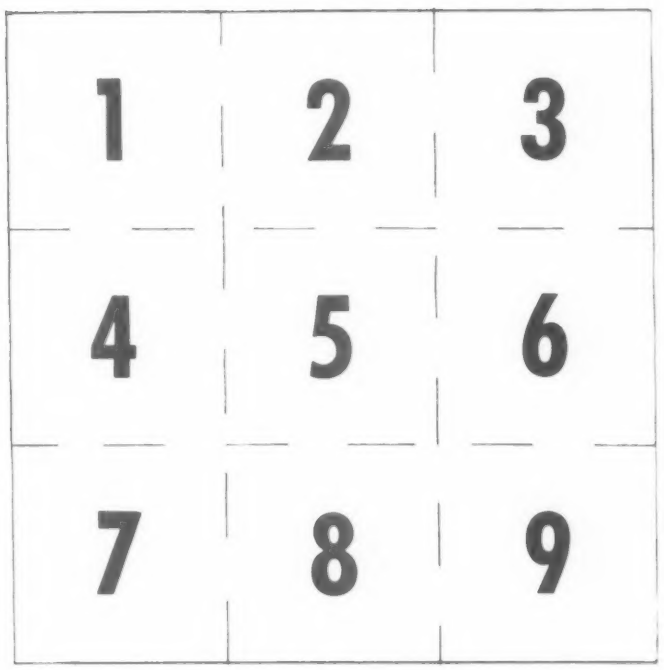

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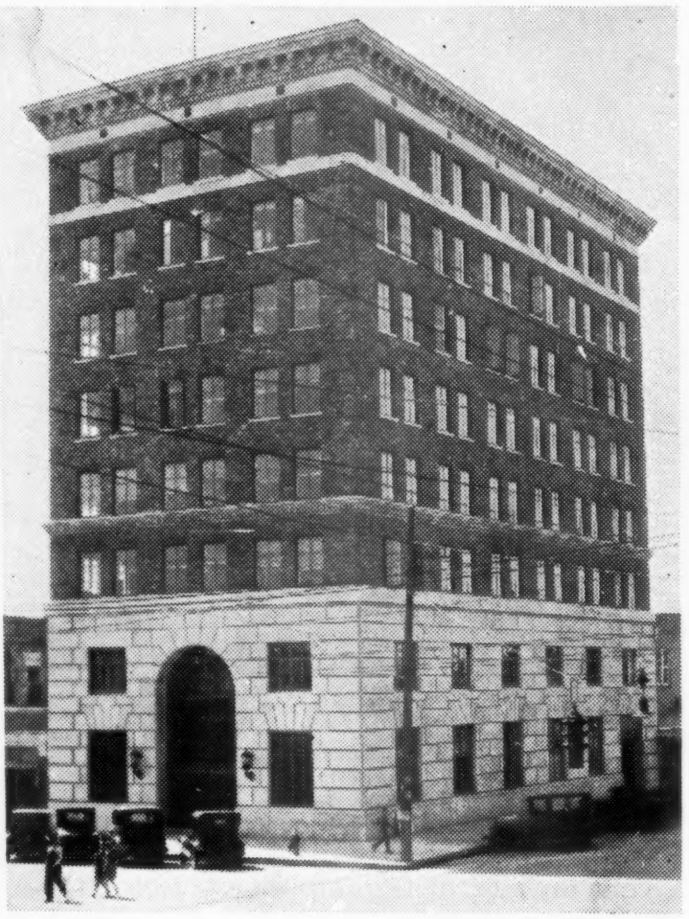

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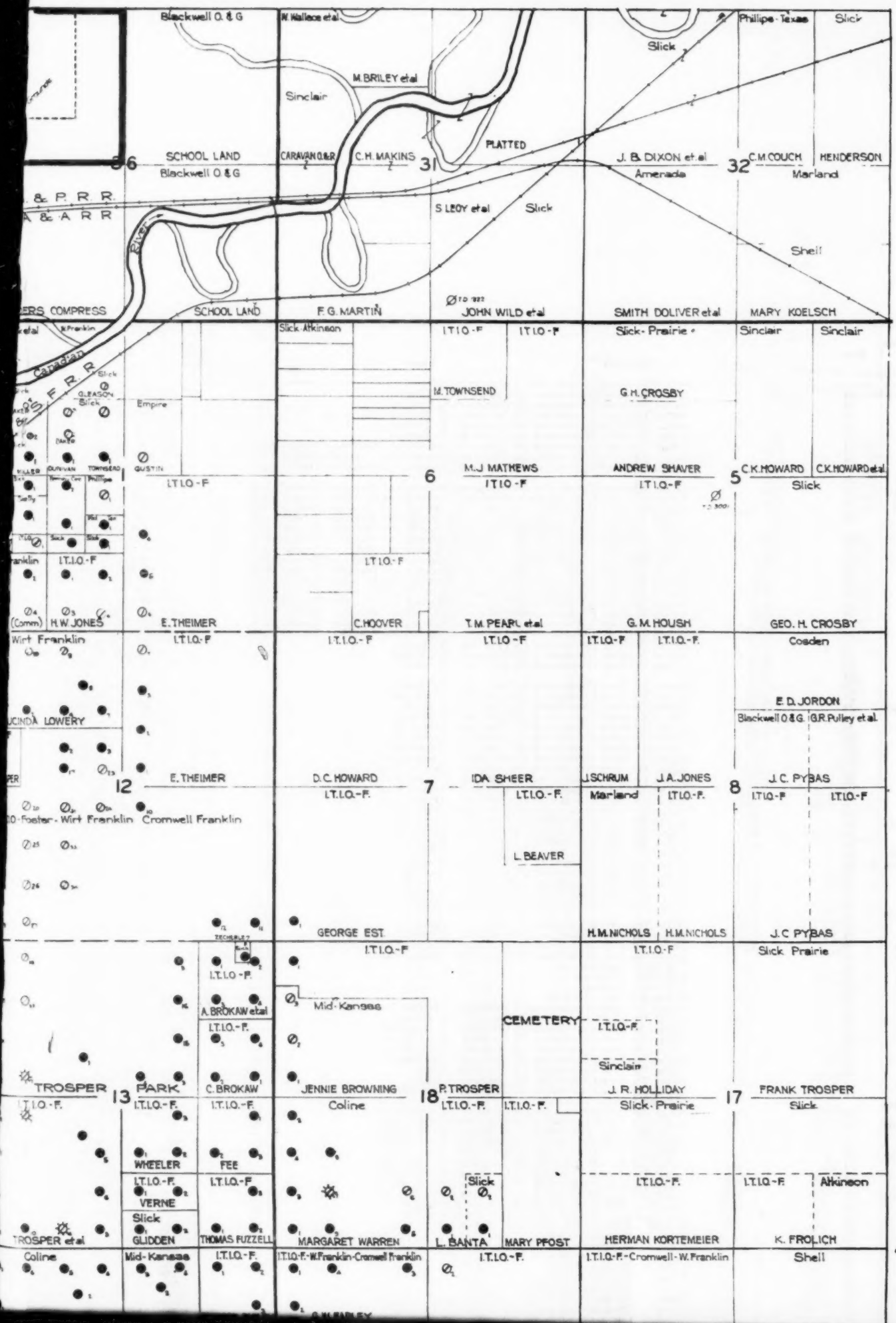
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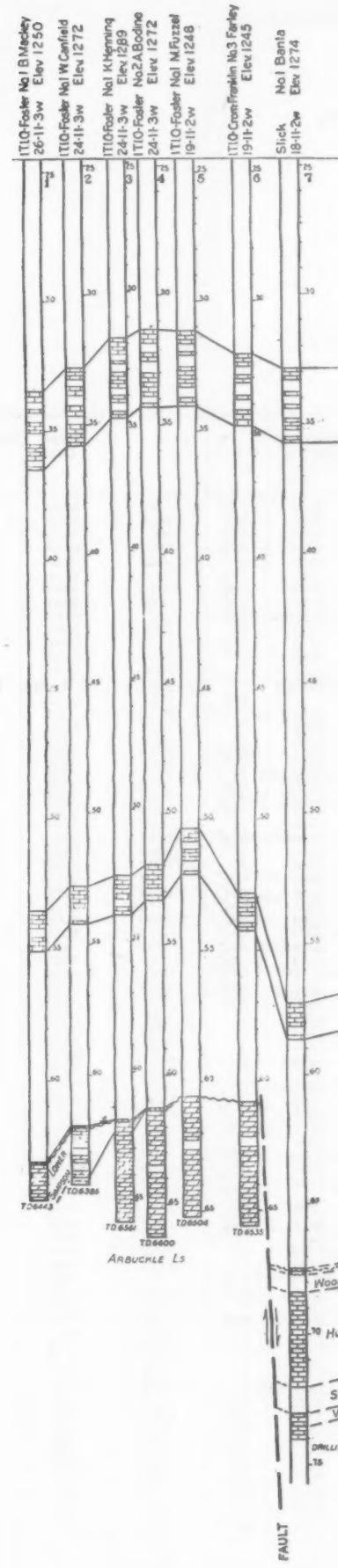
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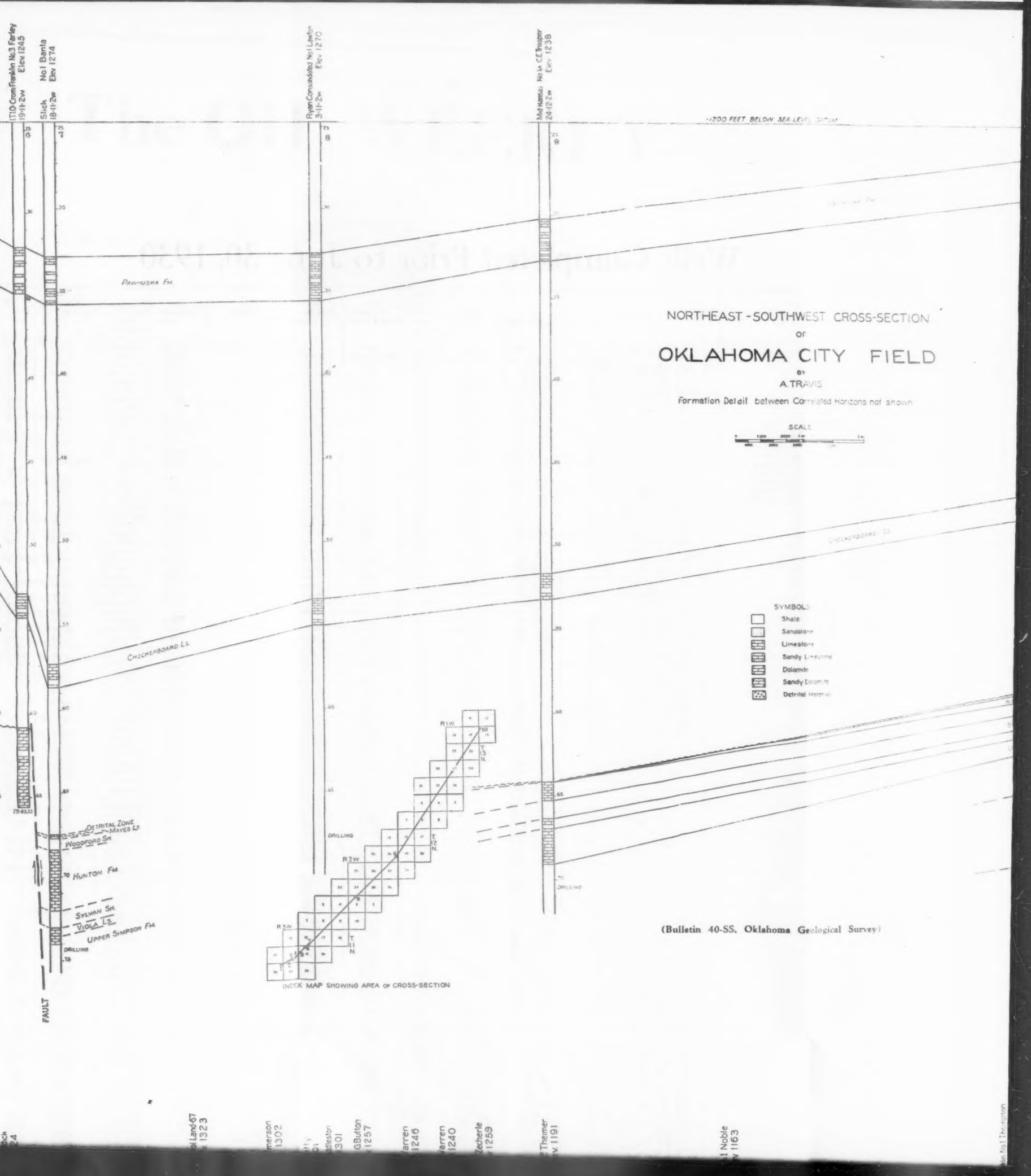

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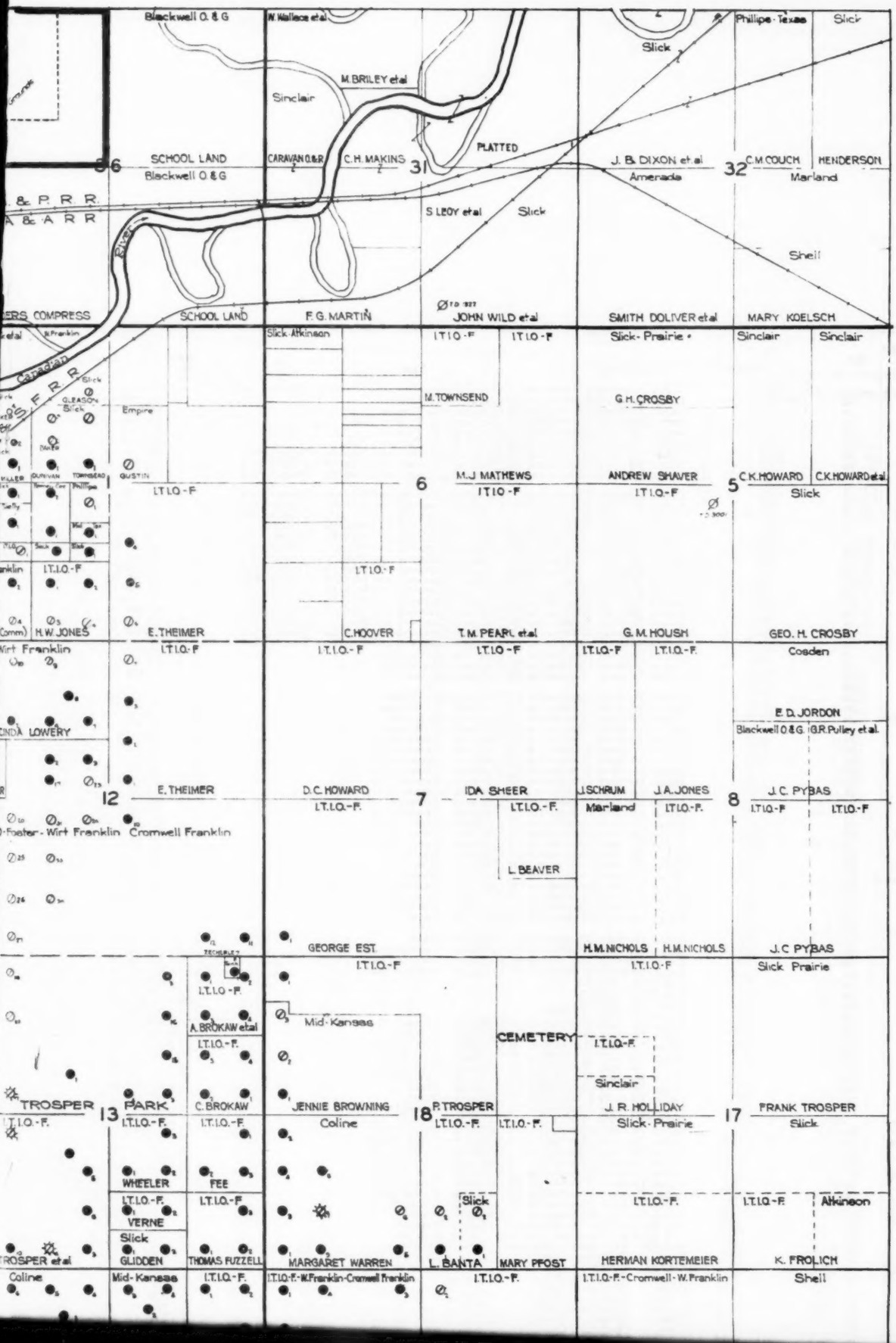

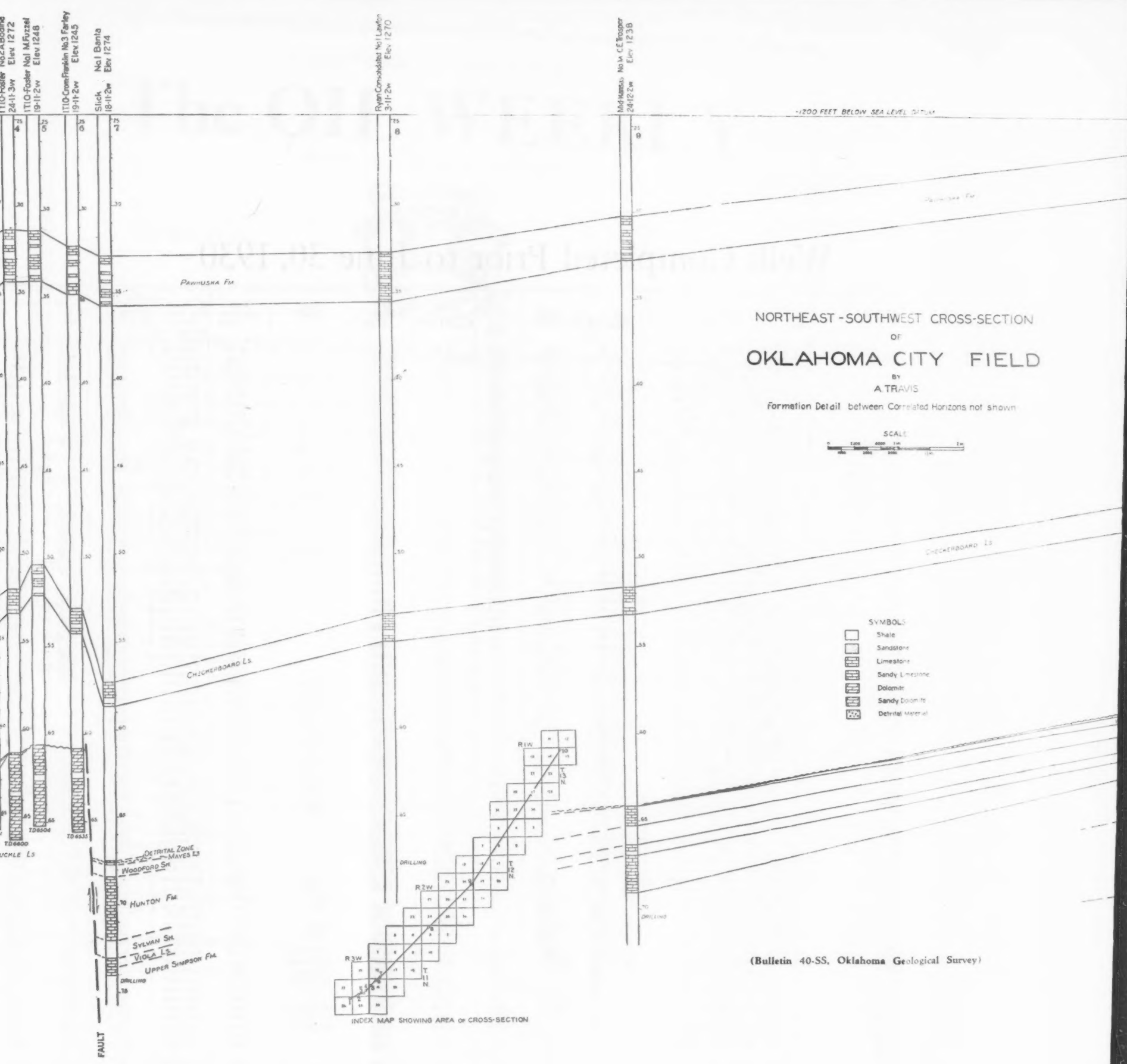

NORTHEAST - SOUTHWEST CROSS-SECTION

OF

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BY

A. TRAVIS

Formation Detail between Correlated Horizons not shown

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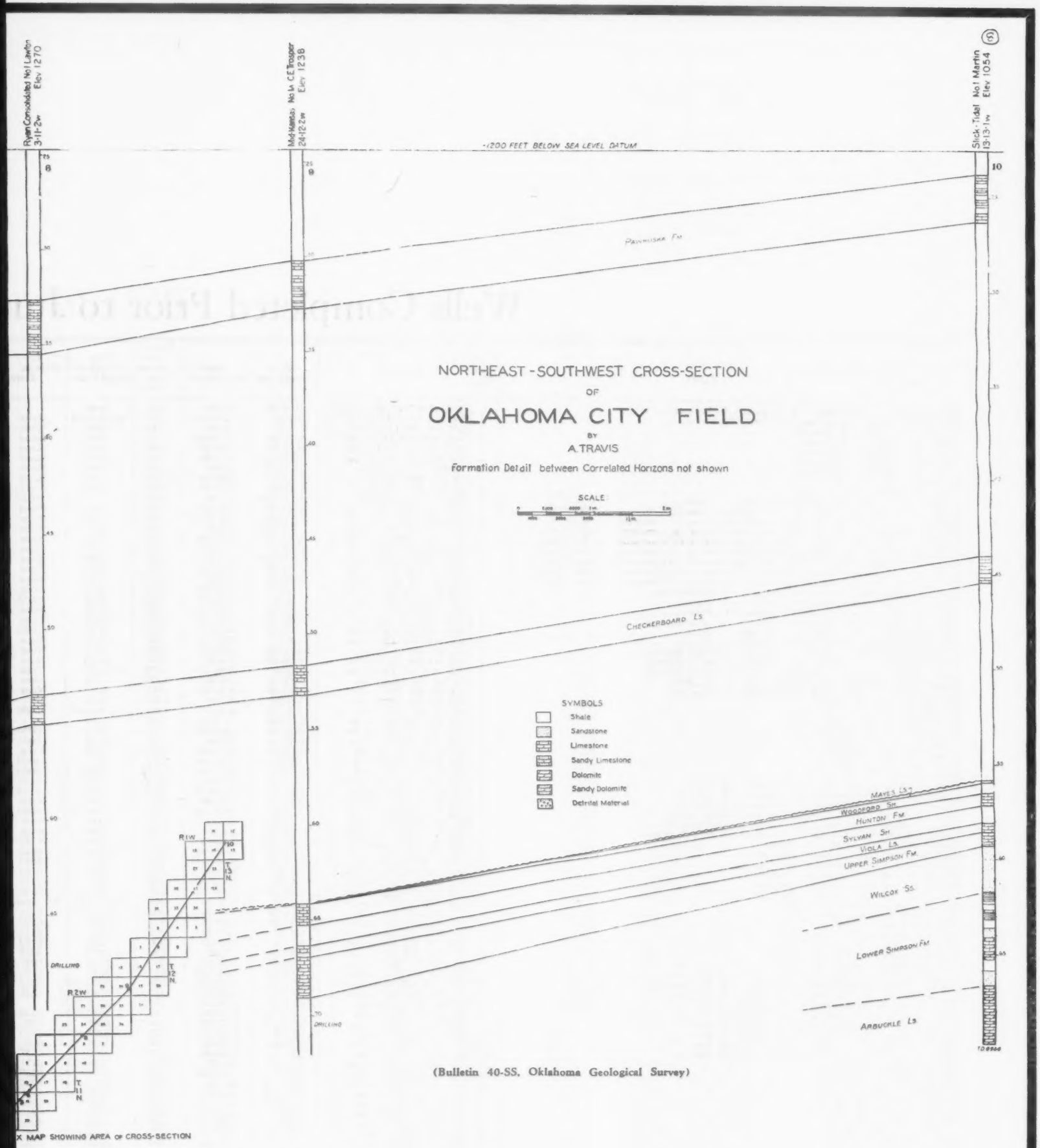

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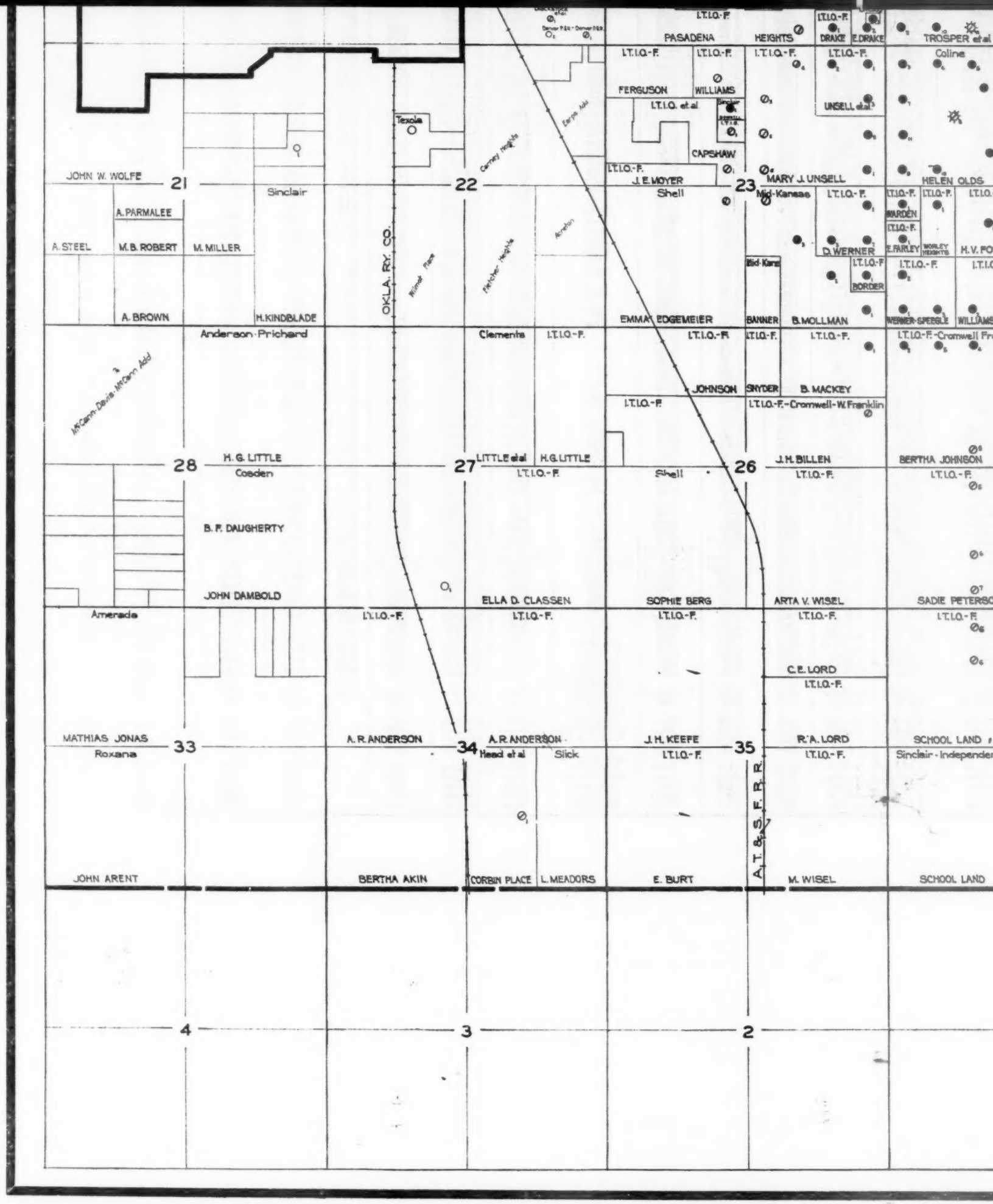
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Coline
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Earps Add
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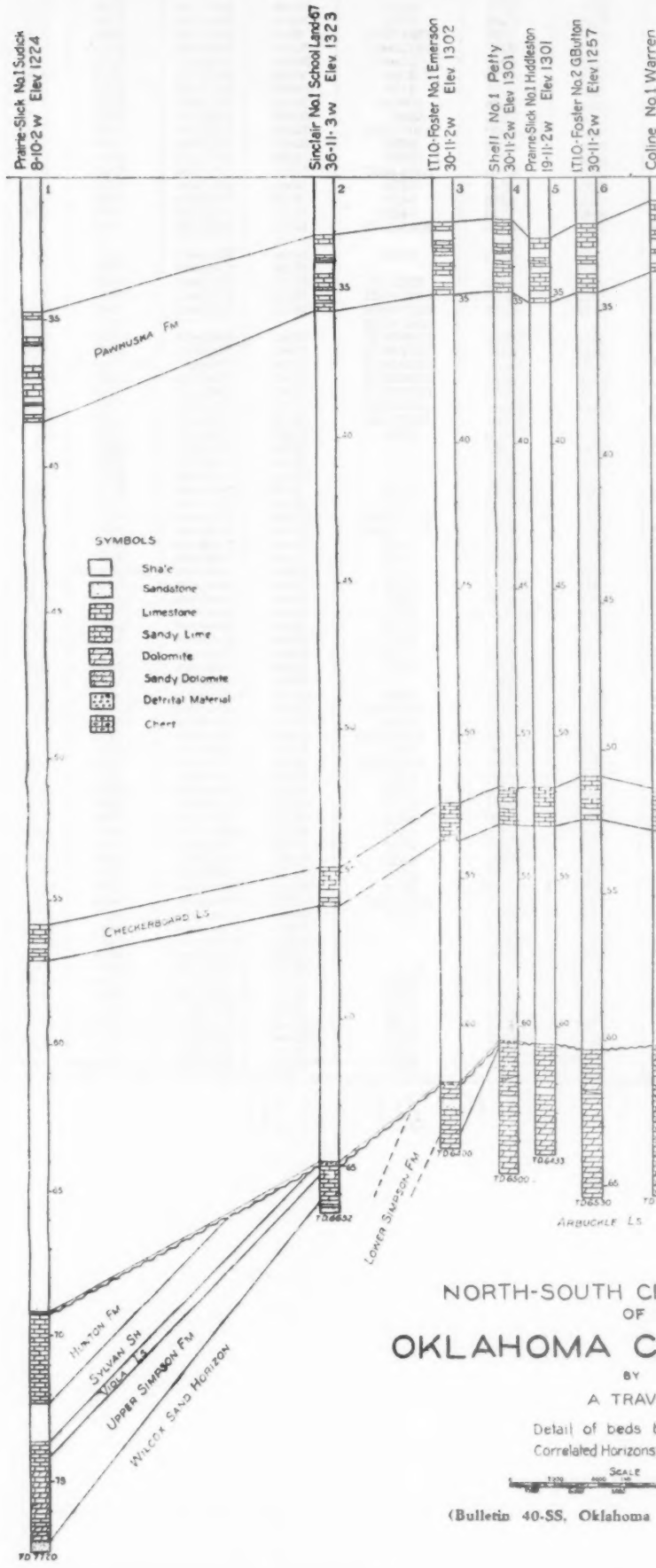

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BY
A. TRAV
Detail of beds
Correlated Horizons
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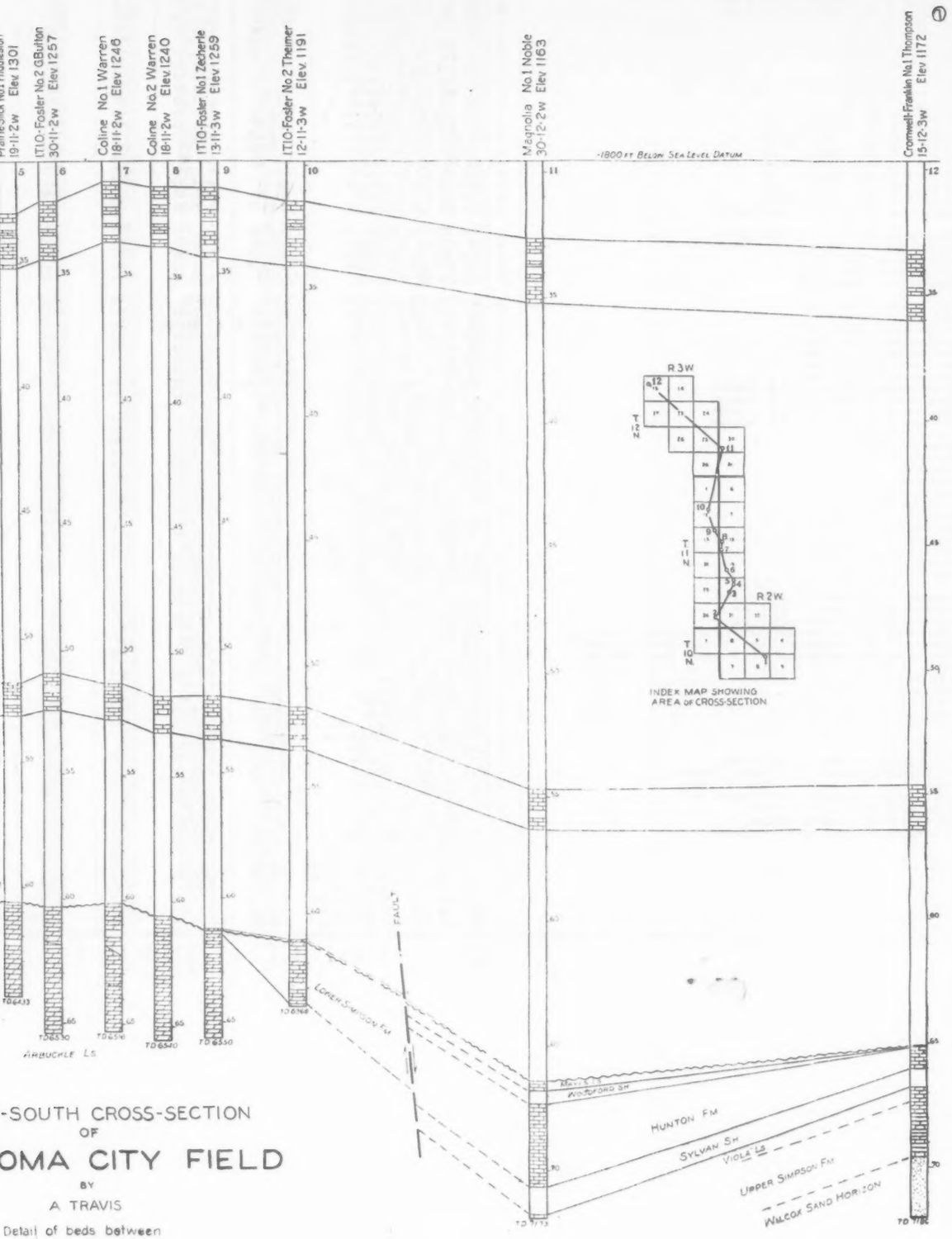

-SOUTH CROSS-SECTION
OF
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BY
A TRAVIS

Detail of beds between
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VOLUME 58, No. 7

AUGUST 1, 1930

Edited Weekly at Houston, Texas

SPENCER W. ROBINSON, EDITOR

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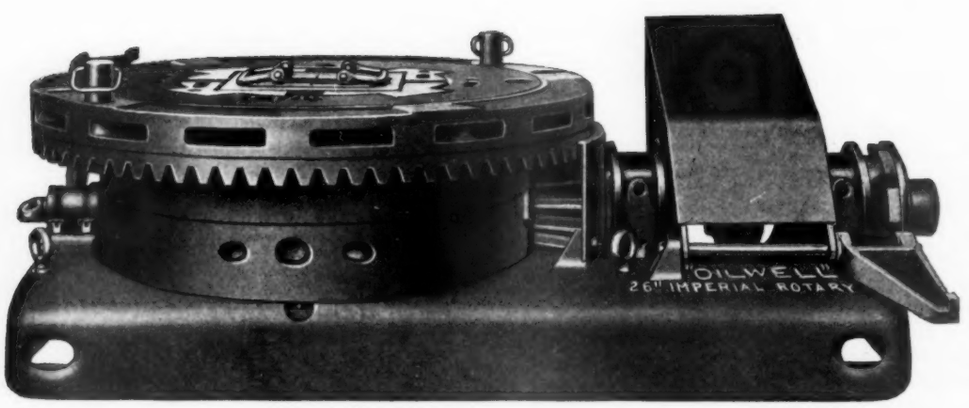

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THE OIL WEEKLY

VOLUME 58, NO. 7 AUGUST 1, 1930

What Constitutes Safe and Sane Stocks of Petroleum

By H. J. STRUTH
Staff Economist

WHILE most oil men will agree that the petroleum industry is carrying excessive stored supplies of gasoline and crude oil, it has been rather difficult to ascertain a definite figure of what would constitute a normal working stock of finished gasoline and to what extent a given supply of that product should be supported by an above-ground reserve of raw material. After considerable study of this question, which involved the gathering of statistics on 40 lines of industry outside of the petroleum industry as well as verbal and written discussion with leaders of thought along this line, the writer has arrived at the conclusion that present stored supplies of both gasoline and crude oil are from 33 to 46 per cent above normal.

Using gasoline as a basis, upon which there seems to be unanimous agreement that the industry should not carry more than 30 days of supply on hand, it was found that a normal crude supply would constitute an equivalent supply of gasoline in raw material of about twice the amount of finished gasoline in storage. Accordingly, it was concluded that the quantity of crude carried in storage should not exceed 106 days of supply, or approximately three months of normal demand. On a three-to-one ratio basis, it becomes apparent that the over-burden of excessive storage of these products would be relieved to such an extent as to exert a favorable influence upon the market structure of both gasoline and crude. Establishing such a "dead line" for inventories, collectively and individually, would preserve a state of equilibrium that could not fail to be accompanied by prosperity in both the producing and refining branches of the industry.

If 30 days' supply of gasoline is sufficient to meet current market requirements, there is every reason to believe that a three months' supply of crude is sufficient to meet any emergencies under existing conditions. Since a 30-day supply of gasoline represents a minimum crude supply of 53 days, based upon a minimum recovery of 40 per cent gasoline from crude, it would seem that the equivalent of two months of gasoline supply in crude would suffice to furnish market requirements at any period of the year. The following tabulation presents some idea of the changes in inventories necessary to effect a normal situation at present:

	Actual Stock June 1, 1930	Economic ideal Storage	Reduction Necessary	Per Cent Reduction
Crude Oil	527,391,000	285,660,000	241,731,000	46
Gasoline	54,034,000	36,030,000	18,004,000	33

In arriving at the normal stored supply of crude that would be equivalent to a 60-day supply of gasoline, it was found necessary to consider, first of all, the actual quantity of refinable crude in the United States. On June 1, 1930, refinable crude stocks amounted to 421,831,000 barrels, excluding 105,560,000 barrels of heavy crude and fuel oil in California. Assuming that a normal supply of gasoline would amount to 36,030,000 barrels, or 30 days' supply, the equivalent quantity of crude necessary to assure a 60-day supply in raw material, at an average minimum yield of 40 per cent, would call for a stored supply of refinable crude of 180,100,000 barrels. This, together with the supply of heavy crude and fuel in California would constitute a maximum crude supply of 285,660,000 barrels, or a supply equivalent to 106 days of normal demand.

Inventories Tabulated

Table 1 shows an interesting tabulation of inventories held by 34 industries, expressed in days of supply on hand as of about April 1, 1930. It will be noted that stocks of gasoline and crude oil really show up rather favorably compared with other commodities, particularly cotton, white pine lumber, flooring, boilers, radiators, tile, etc. According to these facts, the average number of days supply of inventories for 34 products is 109, against 191 of crude oil and 53 of gasoline. Further analysis of these facts, however, brings to light the reasons for carrying large inventories in some lines. For example, lumber and timber products must be weathered for a certain period of time before they are ready for the consumer, which accounts for the apparently excessive supplies of these products on

TABLE 1
Inventories—34 products as of April 1, 1930

	Daily Supply on Hand
Crude petroleum	191
Gasoline	53
Iron and steel	128
Copper	104
Tin	12
Zinc	55
Lead	59
Anthracite coal	31
Rubber	44
Paper and pulp	6
Explosives	20
Wool	117
Cotton	351
Silk	49
Pine lumber	113
Brick	135
Cement	119
Glass	36
Sugar	31
Tile	140
Cotton goods	50
Enameled ware	105
California white pine	329
Flooring	260
Boilers	479
Radiators (heating)	453
Sheet steel	21
Copper wire cloth	84
Tires	84
Newsprint	4
Box Board	9
Methanol	36
Ethyl alcohol	26
Butter	6
Average 34 commodities	110
Crude oil	191
Gasoline	53

hand. In other lines, where unusually large inventories are experienced, it is obvious that they are primarily due to over-production. Table 2 emphasizes the over-production situation in various lines of industry that are carrying excessive stocks. In most instances, it will be noted that production is considerably larger than current consumption, having resulted in the accumulation of excessive inventories.

Table 3 presents a composite view of the inventory situation in the major classifications of the various product lines. It will be noted that foods and chemicals carry the lowest inventories, followed by rubber and tires; building materials, metals, minerals and fuels; textiles and timber products. If the products classified as perishable, combustible and evaporative are grouped together, as shown in Table 4, a striking result is obtained. This shows that products under this classification, including crude oil and gasoline, carry an average inventory of 52 days' supply. On the other hand, if crude oil and gasoline are eliminated, it is seen that the average is reduced to but 28 days' supply of inventory. In view of the fact that both gasoline and crude oil are subject to evaporation losses it becomes obvious that the petroleum industry is pursuing a decidedly uneconomic procedure in carrying what is undoubtedly an excessive stored supply. It is this phase of the economic situation within the petroleum industry that has been responsible for demoralized market values of crude and all other petroleum products.

Comments and Suggestions

Among many comments and constructive suggestions received from various oil company executives in the United States are the following from E. J. Sadler, Standard Oil Company of New Jersey, 26 Broadway, New York:

"Our view of a normal stored supply of crude and products varies with conditions. If a company had a large shut-in production adjacent to its plant, its requirements for stored crude would be much smaller than if it were a purchaser of crude with a relatively insecure supply. For this reason we think that different companies would have different views, dependent on their own particular situation.

"Some years ago we were able to agree that 100 days' crude supply was ample for the Standard Oil Company of New Jersey. At the present time, with our own large shut-in production and a more general condition of oversupply, there would certainly be no tendency to increase the figure, and quite possibly there would be an inclination to lower it.

"A study of the fluctuation in gasoline stocks, including the years 1918 to 1929, with a total demand increasing from 92,000,000 barrels to 443,000,000 barrels, shows that in the last year, that is, 1929, there was a variation of slightly less than 15,000,000 barrels between maximum and minimum stocks for the year. In only one year of the 12 was the fluctuation between maximum and minimum stocks greater, that is, in the year 1927, when gasoline prices were so low as to materially reduce refinery activity and result in a fluctuation of 22,000,000 barrels.

"Under these circumstances we feel warranted in saying that even with a moderately increased business above 443,000,000 barrels, we believe that 15,000,000 barrels is the maximum necessary fluctuation in gasoline stocks over the year, the idea being that refineries can increase their activity in time of maximum consumption, and considerably reduce the fluctuation between maximum and minimum stocks witnessed in the past.

"It is our belief that 20,000,000 barrels is ample working stock for the American industry, so that if 20,000,000 barrels is properly distributed among the various districts, peak stocks need not for the next two or three years at least exceed 35,000,000 barrels."

Crude Supply Controls Runs

W. T. Holliday, president of Standard Oil Company of Ohio, Cleveland, Ohio, offered the following views in connection with the question of what constitutes normal stocks:

"In any rationalization of the industry, gasoline ought to be manufactured in accordance with the supply of crude.

TABLE 2
Production, consumption and stocks of industries experiencing over-production
March, 1930

	Production	Consumption	Stocks
Crude Petroleum (bbls.)	77,384,000	83,366,000	532,131,000
Gasoline (barrels)	37,727,000	31,029,000	55,239,000
Boilers (pounds)	9,858,000	4,935,000	78,787,000
Radiators (Sq. Ft. Htg. Surf.)	8,518,000	3,912,000	59,064,000
Copper (tons)	127,064	73,644	256,020
Wool (pounds)	*	37,195,000	145,458,000
Cotton (bales)	*	508,576	5,952,000
Calif. White Pine (ft.)	60,651,000	56,767,000	623,554,000
Flooring (feet)	6,107,000	3,060,000	26,523,000
Cement (barrels)	11,215,000	5,908,000	23,519,000
Tile (square feet)	4,404,000	4,079,000	19,028,000
Tire (number)	3,891,000	3,587,000	10,010,000

*Not available.

TABLE 3
Grouped products

	Days' Supply on Hand
Metals, minerals and fuels	110
Timber products	168
Textiles	141
Rubber and tires	64
Building materials	107
Food and chemicals	24
All products	110

There is now refining capacity more than sufficient currently to supply the peak demand. Also with continuous processes there is greater flexibility in refining than there used to be. There is a much wider margin between maximum capacity and economical minimum runs than there used to be in the days when inventories had to be accumulated in the winter months to take care of the peak demand of the summer.

"There appears to me therefore to be no necessity of the industry carrying more than 30 days' supply of gasoline. Our own company, I believe, only averages about 20 days' supply, and we attempt to coordinate production with prospective demand. I realize, however, that it is difficult for the industry as a whole to do this because refineries which do not have their own marketing outlets must find it difficult accurately to forecast their sales.

"American industry generally has faced for some time the problem of excess production capacity and is endeavoring to solve the problem through coordination of production and forecasted sales. Forced high-pressure distribution has been found to be a failure."

D. J. Moran, president of Continental Oil Company, Ponca City, Oklahoma, gave the following view of the storage situation:

"There is little doubt that an excessive storage supply of crude petroleum and gasoline is being carried by the industry. What constitutes a normal storage supply is a question to which each individual will probably have a different answer. From a review of demand statistics for the past few years, it would seem that 30 days' supply of gasoline would be ample as an average yearly storage. It would probably be uneconomical to stabilize the rate of production of gasoline to meet a seasonal demand. If this were not done, it would be necessary to carry larger amounts in storage during the low demand period, and to reduce stocks considerably under the 30-day average during the peak consumption period. On an average, this would mean that the maximum storage of gasoline would represent a 38-day supply with a minimum storage of approximately 25 days' supply.

Opinions Vary on Normal Supply

"The question of a normal supply of crude storage will no doubt bring out more varied opinions than that of gasoline storage. It would seem, however, that the days supply of crude in storage would be a constantly changing factor. During the past few years, the industry has been able to develop new production within 60 to 90 days after discovery. During that period, it might be logical to assume that a 60 to 90-day supply of crude in storage would be considered normal.

"As the industry develops and as deep drilling becomes common, it will probably take a longer period of time to develop additional production. Transportation facilities from new fields must also be considered. A new field that can be developed within 30 days would be of small use to the industry if not located in such a position that it could be made readily available. It seems logical, therefore, to consider that an amount of crude oil equivalent to 120 days' supply might be considered normal. Under present conditions, it could probably be considered a maximum. There are few at present who would consider this amount of storage excessive."

Another interesting view of the storage situation is quoted from a letter received from J. Howard Pew, president of Sun Oil Company, Philadelphia, as follows:

Minimum Stocks — Pew

"In our own company we have adopted the policy of carrying on hand a minimum stock of gasoline equivalent to that which is necessary to take care of 20 days' consumption, and crude stocks sufficient to take care of our business for five months. In the spring of the year, our stock of gasoline must approximate 60 days in order to handle our business through the summer, when our consumption is greater than our production.

"We must carry what would seem an abnormal supply of crude because of the uncertainty of depending on any particular production and the necessity of planning our crude runs in such a way as to keep our refineries busy and shape our sales policy in conformity with the character of crude we are running."

William N. Davis, vice-president of Phillips Petroleum Company, Bartlesville, Oklahoma, stated as follows:

"It is my opinion, in view of the great potential oversupply of crude petroleum and the excessive refining capacity which I understand is sufficient to take care of day-to-day demand for products at the peak of the consuming season, that minimum working stocks both of crude petroleum and petroleum products are all that could be considered normal. In other words, there need be no large storage against a possible shortage."

W. S. Farish, president of Humble Oil & Refining Company, Houston, Texas, furnished the following interesting conclusions in answer to the question of what could be considered a normal storage of crude and gasoline:

"I am of the opinion that the oil industry carries stocks, both gasoline and crude oil, entirely too large. I think the industry should operate throughout the year on the approximate average monthly consumption of crude, taking up whatever excess demand that may come in the periods of greatest consumption by increased runs in these periods. As almost every refinery in the United States is operating under capacity this should be comparatively easy and much better than carrying stocks against anticipated demand.

Surplus Stock Detrimental

"To my mind, there is nothing as detrimental to the maintenance of markets as surplus stocks. Sooner or later, somebody gets weak-kneed, has a billious day and decides to cut loose at a sacrifice. One start of this character usually means a weakening of the market. I believe we can easily handle our gasoline business with maximum stocks at any time of 35,000,000 barrels, and the range should be from 20,000,000 to 35,000,000 barrels rather than from 25,000,000 to 55,000,000 barrels, as it is at the moment. As to

(Continued on page 162)

TABLE 4
Perishable, combustible and evaporative products

	Days' Supply on Hand
Crude oil	191
Gasoline	53
Methanol	36
Ethyl alcohol	26
Butter	6
Explosives	20
Anthracite coal	31
Average	52
Average, excluding petroleum products	28

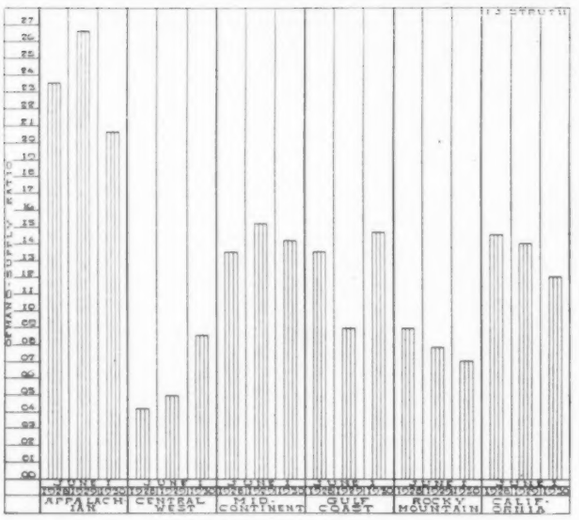


FIGURE 2

Technical condition of the crude market. Bars show position of demand-supply barometer as of June 1, 1928, 1929, 1930. Prices generally follow movement of this barometer

THE OIL WEEKLY MID-

Over Production Increased

EARLIER estimates of the demand for crude this year contemplated increased refinery efficiency and a consequent decline in utilization under 1929, but the results of the first half of this year necessitate a downward revision that has a most important bearing upon production curtailment activities. In fact, continued expansion in refinery cracking facilities has reached the stage where the average gasoline recovery per barrel of crude run amounts to 42 per cent, whereas the recovery during May, 1929, was only 38 per cent. Analysis of the Bureau of Mines figures for the first five months of this year indicate that the average gasoline recovery from crude will approximate 41.5 per cent this year, against an earlier estimate of 40 per cent. What this means to the producer can best be illustrated by the fact that it will be possible for the refining industry to produce this year's gasoline requirements from 41,000,000 barrels less crude than was actually consumed last year.

In comparing the results of crude production curtailment thus far in the year with results being obtained at refineries in the way of increased gasoline recovery, it becomes apparent that the producer is faced with the necessity of continued and wider application of proration activities. In fact, a look into the immediate future indicates that there will be a race between crude production curtailment and scientific advancement in both the producing and refining branches of the industry. From now on, it will be decidedly necessary for the producer to keep abreast of refining developments and endeavor to anticipate the need for crude, not only on the basis of growing demand but on the basis of increased gasoline recovery as well.

Crude Market Changed

That a radical change has accompanied recent developments in the producing branch of the industry is evident from the fact that the crude market is no longer governed solely by the producer. Today, the course of the crude market is dependent upon the course of the gasoline market. Recent events bear out the fact that the refiner is largely responsible for the course of crude prices. As long as there is an over supply of gasoline, reacting unfavorably upon the gasoline market, there will be little chance of recovery in the crude market. Increased yields of gasoline from crude, through the advent of cracking, have placed this product in a more direct relationship to the crude market than ever before. It is believed, therefore, that future changes in crude prices will perhaps come more frequently than in the past, with probably a lesser degree of fluctuation. This will undoubtedly have a stabilizing influence upon the crude market and will establish closer conformity with the gasoline market. It appears obvious, therefore, that the producer's market will be governed more by the supply of gasoline than by the actual above-ground supply of crude. Only in the event that a number of major flush areas should stage an alarming natural decline in production would the crude market revert to a more independent position. Thus, at least until present and prospective producing areas offer an opposite alternative it looks as though the crude market will be "pegged" to conform somewhat to the trend of the gasoline market—and that means a rather narrow range for some time to come.

Figure 1 shows the trend of crude prices, accompanied by a tabulation of actual changes announced during the first half of this year. Figure 2 presents a graphic view of the "technical position" of the crude market in various major producing areas. The bars, comparing the market situation as of June 1 for three years, represent the ratio of demand to supply for these periods. It will be noted that Appalachian, Mid-Continent, Rocky Mountain and California indicate a weak position, justifying present low prices for these grades. On the other hand, the Central West and Gulf Coast areas show a rather strong position, indicating, in the former case, a declining supply against a growing demand and, in the latter case, an accelerated rate of demand that is exceeding the rate of increased supply. The actual figures for the Mid-Continent area emphasize the relationship between these ratios and the price of crude. The comparison is interesting:

Demand—Supply Ratio .1928—.135 1929—.152 1930—.142
Price 36 Gr. Crude .....1928—1.28 1929—1.45 1930—1.29

While the ratios coincide, in most instances, with the price of crude, there seems to be an opposite relationship in the case of California. The ratio of demand to supply there shows a downward trend for the past three years, while crude prices have actually shown a slight increase. Prices in California, Long Beach—26 gravity oil, have increased from 92 cents a barrel in June, 1928, to 1.28 a barrel at

Detailed Statistics of Field Development and Production, First Six Months of 1930, on Page 164, et seq.

YEAR REVIEW SHOWS

Intensified By Efficiency

present. Over the same period, the demand-supply ratio declined from .145 in 1928 to .120 on June 1, 1930. It would apepar, therefore, that California prices are somewhat out of line and are subject to a slight downward revision. The weakness of the Pennsylvania crude market is amply illustrated by the chart. Relatively, the price now in effect, $2.20, is believed to represent the minimum value prescribed by the current ratio of demand to supply. Unless production there continues upward, the present price will probably be the bottom on this move.

TABLE 1

Comparison of the Crude Situation

(All Figures In Barrels)

	1930	1929
Stocks, January 1	528,939,000	490,788,000
Production (5 months)	388,615,000	404,712,000
Imports ((5 months)	25,363,000	37,261,000
Total Supply	942,917,000	932,761,000
Demand (5 months)—		
By Refineries	396,910,000	396,443,000
Other Domestic	9,030,000	15,226,000
Exports	9,586,000	8,880,000
Total Demand	415,526,000	420,549,000
Stocks, June 1	527,391,000	512,212,000

Crude Situation Changed

A comparison of the crude oil situation for the first five months of this year against the same period last year reveals a radical change. Stocks of crude on June 1, 1930, aggregated 527,391,000 barrels, a gain over the same date last year of 15,179,000 barrels. On the other hand, stocks have declined since January 1 this year by 1,548,000 barrels, while last year there was an increase over the same period of 21,424,000 barrels. Production for the first five months of this year was smaller than last year by 16,097,000 barrels. Imports have also declined during that period under last year to the extent of 11,898,000 barrels. With all of this, the current crude supply is larger than it was last year by 10,156,000 barrels, while the demand for the first five months of this year shows a decline from last year of 5,023,000 barrels. Notwithstanding the fact that the refining industry was faced with an over-supply of gasoline this year, runs to stills for the first five months of this year were maintained at a slightly higher rate than last year. Runs aggregated 396,910,000 barrels for the first five months of this year, against 396,443,000 barrels during the same

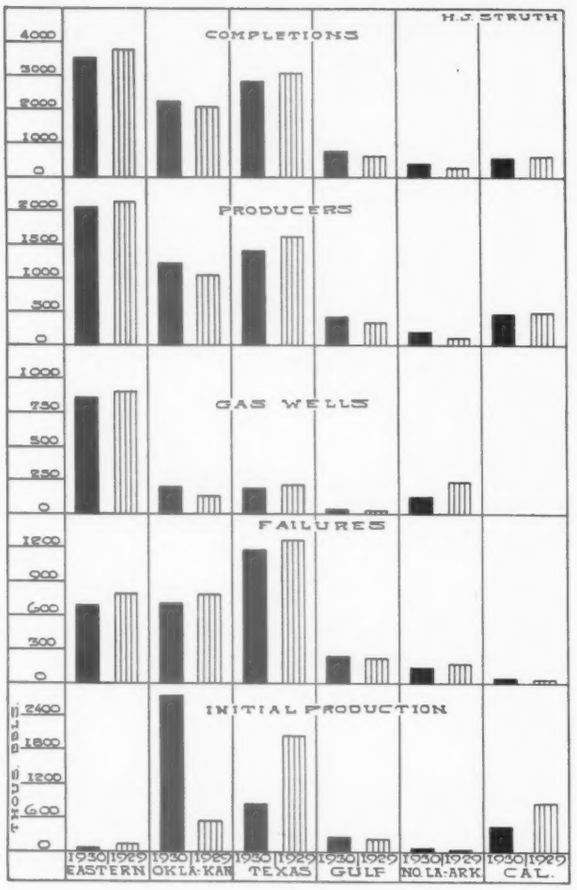


FIGURE 3

Graphic comparison of field developments for first six months of 1930 *and* 1929. *Solid bars represent* 1930*; ribbed bars* 1929

period of last year. Table 1 presents a condensed summary of the crude picture as it appeared on June 1, in comparison with last year.

By projecting the supply and demand facts to the end of this year it is seen that the producer will be forced to continue curtailment efforts in order to prevent market demoralization. Table 2 presents a projected view of the

TABLE 2

A Projected View of the Crude Situation

		Barrels
Indicated Demand, year 1930.		1,003,000,000
Production, first 5 months	389,000,000	
Imports, first 5 months	25,000,000	414,000,000
Crude needed, balance 1930		589,000,000
Indicated Imports, balance 1930		35,000,000
Domestic Crude Required, balance 1930		554,000,000
Stock Increase, year 1929	44,000,000	
Stock Decrease, first 5 months	1,548,000	42,452,000
Normal New Supply Needed, balance 1930		511,548,000
Daily Average Production Necessary, balance 1930		2,390,411

crude situation for the balance of this year, showing that the net result fixes the maximum economic production limit at not more than 2,390,411 barrels daily. Although the crude demand will exceed 1,000,000,000 barrels this year, and there is every reason to believe that imports of foreign crude will not exceed 60,000,000 barrels, the facts show that it will be decidedly necessary for producers to make curtailment provision not only for the actual market requirements over the balance of this year, but also for the excess production that has accumulated since the first of this year. In addition, it appears necessary to provide for a substantial reduction in crude storage. Thus, while the quantity of domestic crude actually required over the last seven months of this year aggregates 554,000,000 barrels, or a daily average of 2,588,000 barrels, there is an urgent need that the industry reduce output sufficiently below that figure to wipe out the excess accumulations of last year. Production is actually below the indicated requirements of the United States at this time, having dropped to a low point of 2,500,100 barrels daily during the week ending July 19. At this rate, it will not be difficult to effect a further reduction of about 150,000 barrels daily, bringing the production curve down to about 2,400,000 barrels a day.

STATUS OF PRODUCING STATES
July 19, 1930

	Daily Average Production Week Ending July 19, 1930	Economic Production Limit Balance of 1930	Additional Curtailment Required
Oklahoma	586,300	550,000	36,300
Kansas	116,300	105,554	10,746
Texas	821,100	786,860	34,240
Louisiana	65,200	58,749	6451
Arkansas	55,500	60,000	—4500
California	614,300	596,000	18,300
Balance of U. S...	241,400	233,248	8,152
Total U. S.....	2,500,100	2,390,411	159,689

Must Curtail Further

Table 3 shows an up-to-the-minute picture of the production situation, suggesting additional curtailment necessary in the various major areas. According to these facts, there is need for further curtailment of crude production to the extent of 159,689 barrels a day. At present, there is assurance that Oklahoma will reduce production to 550,000 barrels daily; Kansas will probably bring production down to 105,000 barrels daily; California is expected to maintain production at or near 596,000 barrels daily, while Texas operators are giving serious thought to the need for statewide proration that may reduce output to 786,860 barrels daily, and possibly somewhat below that figure. If producers in the major producing states follow out the curtailment recently proposed, bringing production down to a figure somewhat conforming to the economic limits shown in Table 3, there is every reason to believe that the economic status of the industry will have shown material improvement by the end of this year. Of primary consideration, however, is the need for adequate control of refinery still runs. It is obvious that the producer cannot alone solve the over-production problem, without the aid of the refiner.

Table 4 brings the refining situation down to date, showing what has been done in the first five months of this year and what must be done during the balance of the year to correct the economic status of the industry. During the first five months of this year, the refineries of the United States consumed 396,910,000 barrels of crude in the manufacture of gasoline and other refined products. On the basis of present and indicated gasoline consumption for this year it is evident that the normal demand for crude should not exceed 947,000,000 barrels. Since at least 60,000,000 barrels of this quantity will be imported from foreign fields, the net requirements by refineries for domestic crude will only amount to 887,000,000 barrels this year. This result has been calculated on the basis of an average gasoline yield of 41.5 per cent, assuming that the total gasoline demand this year will aggregate 393,000,000 barrels. The latter figure represents the net quantity of gasoline that should economically be produced from crude, the total demand for this year be indicated to aggregate 472,000,000 barrels.

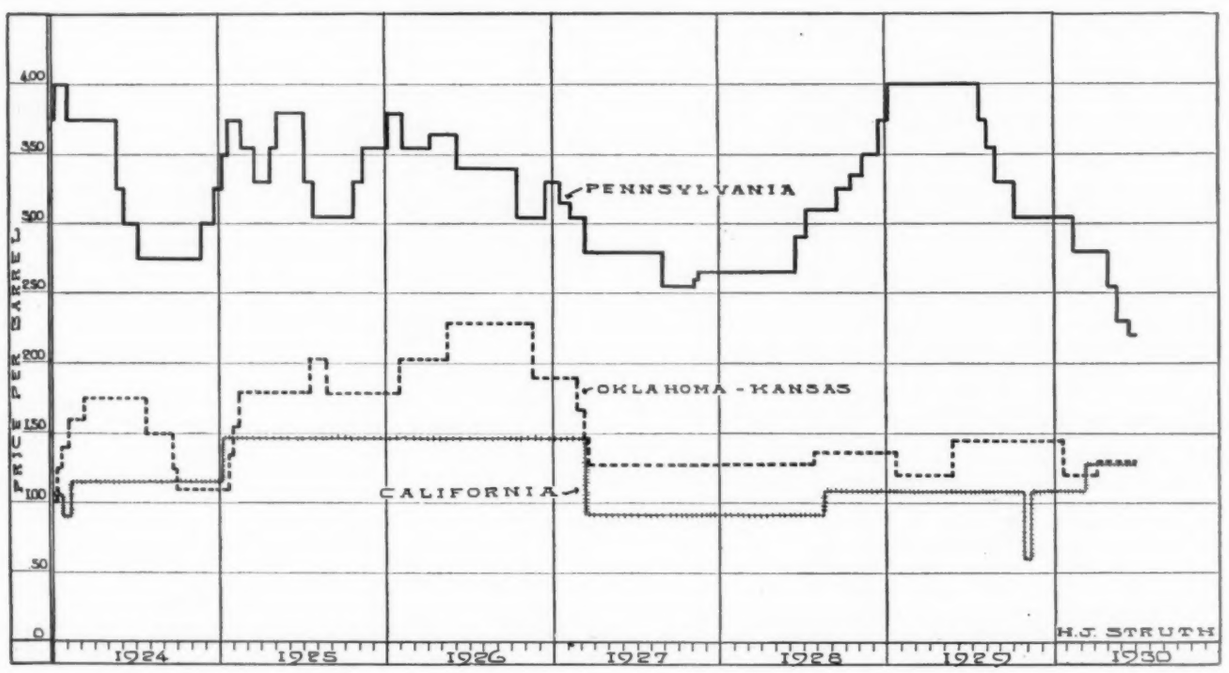


FIGURE 1

Trend of the crude market, showing changes in posted prices of three principal areas during past 6½ years. Price changes during 1930, *by dates, tabulated on pagep* 162

REFINERY CRUDE REQUIREMENTS
1930
Thousands of Barrels

	Total Crude Needed Year 1930	Actual Still Runs 1st 5 Mo.	Required Balance of 1930 Total	Required Balance of 1930 Daily Average	Approximate Daily Still Runs July 12 1930
East Coast ...	168,492	70,619	97,873	457	475
Appalachian ..	33,382	13,991	19,391	90	90
Indiana, Illinois, Kentucky ..	115,799	48,534	67,265	314	319
Oklahoma, Kansas, Missouri ...	115,577	48,441	67,136	314	310
Texas	219,331	91,927	127,404	595	603
Louisiana, Arkansas ..	64,320	26,958	37,362	175	182
Rocky Mountains .	21,824	9,147	12,677	59	67
California	208,275	87,293	120,982	565	577
Total U. S..	947,000	396,910	550,090	2,570	2,622

Must Curtail Still Runs

Of late, refiners have reached the realization that concerted effort to curtail still runs is necessary to prevent even lower prices for products than are now in effect. As a result, runs to stills have been materially reduced, having recently reached the lowest point this year. Table 4 shows how the prescribed limit compares with a recent check of

COMPARISON OF PERTINENT FACTS ON THE OIL SITUATION

	First Six Months 1930	1929
Total Crude Production (Bbls.)	473,466,735	469,600,690
Daily Average (Bbls)	2,615,838	2,594,479
Total Wells Drilled.....	10,218	10,438
Oil Wells Completed	5,835	5,798
Initial Production (Bbls.) ...	4,336,419	3,745,410
Initial Production per Well (Bbls.)	743	646
Crude Stocks June 1 (Bbls.)..	527,391,000	512,212,000
Days of Supply on Hand....	190	177
Total Crude Demand (5 months) (Bbls.)	415.526,000	420,529,000
Price of Oklahoma Crude (36-36.9 Gravity) (June 30).	1.45	1.29
Price of Pennsylvania Crude (Nat. Transit) (June 30) ..	4.00	2.20
Price of California Crude (Long Beach 26 Gr.) (June 30)	1.09	1.28
Crude Run by Refineries (5 months) (Bbls.)	396,910,000	396,443,000
Daily Average (Bbls.)	2,628,543	2,625,450
Crude Imported (5 months) (Bbls.)	25,363,000	37,261,000
Daily Average (Bbls)	167,966	246,761
Gasoline Consumption (Domestic) (5 months) (Bbls.)	154,315,000	140,799,000
Gasoline Exports (5 months) (Bbls.)	27,039,000	23,164,000
Gasoline Imports (5 months) (Bbls.)	6,488,000	2,783,000
Gasoline Recovery from Crude, May (%)	42	38
Refinery Price of U. S. Motor Gasoline (F. O. B. Oklahoma) (June 30) (Cents per Gallon)	6¾	9¼
Gasoline Stocks (June 1) (Bbls.)	54,046,000	44,672,000
Days of Supply on Hand....	40	35
Natural Gasoline Production (5 months) (Bbls.)	22,169,000	20,650,000
Natural Gasoline Utilization (5 months) (Bbls.)	17,264,000	17,264,000
Price of Grade "A" Natural Gasoline (F. O. B. Oklahoma) (Cents per Gallon)...	4½	6⅛

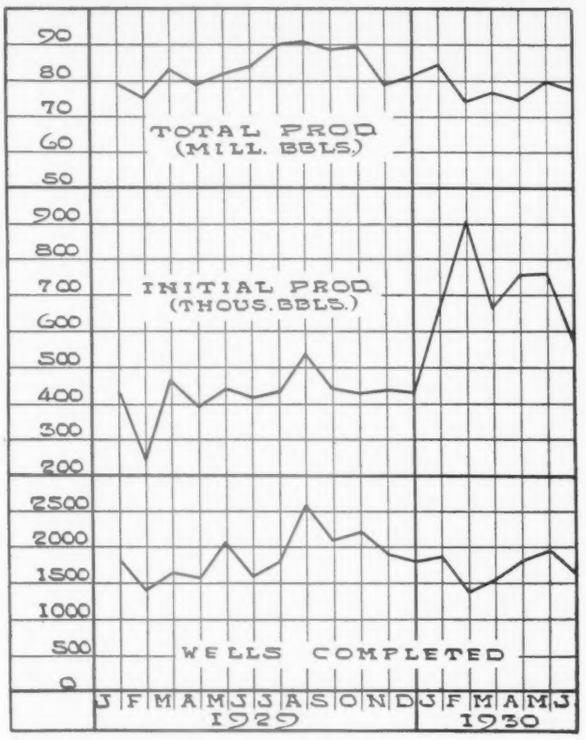


FIGURE 4

Field development of all fields in the United States, exclusive of the Rocky Mountain area

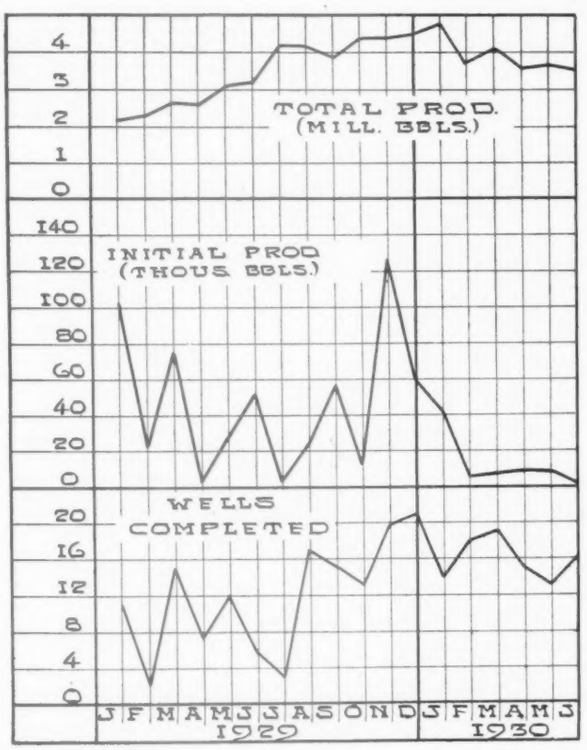


FIGURE 5

Field development of the Yates pool, Pecos County, Texas

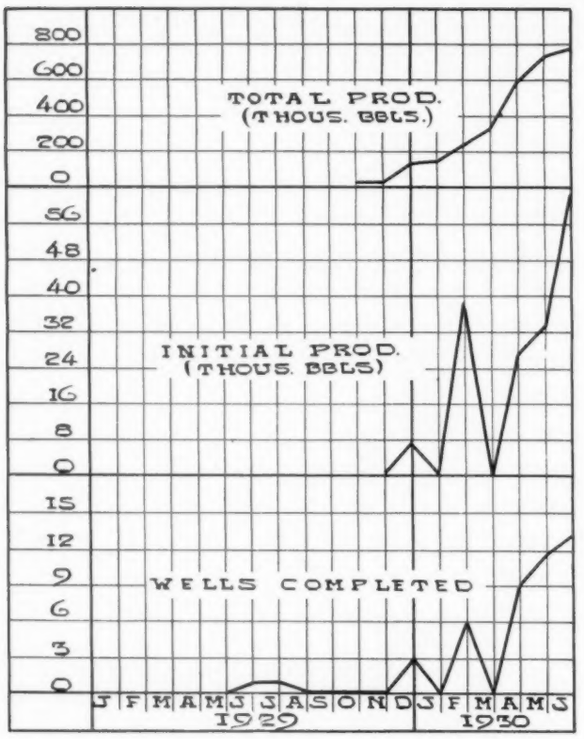


FIGURE 6
Field development of Van, Van Zandt County, Texas

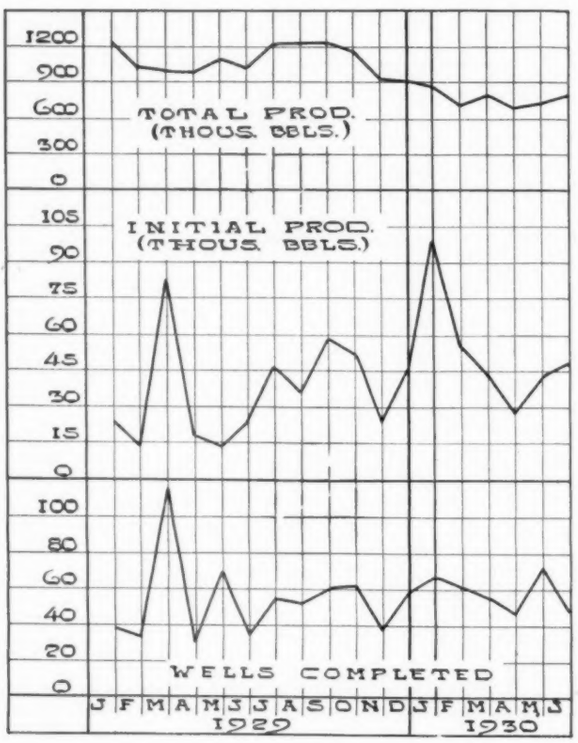


FIGURE 7
Field development of the Seminole Area, Oklahoma

approximate actual still runs for various refining sections of the United States. It will be noted that the situation has reached the stage where practically little more reduction in runs is necessary to bring about a more stabilized supply picture. East Coast, and California seem to be the only districts that are still somewhat out of line. If these districts manage to bring about further necessary reductions in runs schedules and the other sections endeavor to maintain runs at the rates indicated in the table, the industry as a whole will have reduced still runs to a maximum total of 2,570,000 barrels daily. This seems to be the ideal toward which the industry must strive in order to effect a satisfactory reduction in gasoline stocks this year. The move to curtail runs at this time is a timely one and if followed out with any degree of success is bound to correct the top-heavy situation confronting the industry at present.

Conditions in the natural gasoline industry present a rather complex picture. For the first five months of this year, consumption of natural gasoline was exactly at the same rate as during the same period of last year; total 17,264,000 barrels. During this period production increased from 20,650,000 barrels in 1929 to 22,169,000 barrels in 1930. As a result, stocks have increased to the extent of 1,048,000 barrels since January 1. Grade "A" natural gasoline at Oklahoma points is now quoted at about 4½ cents a gallon, compared with 6⅛ cents in 1929; 8½ cents in 1928 and 4¾ cents in 1927. Expansion of the natural gas industry, with the demand for this product more than equal to the current output, has placed the natural gasoline manufacturer in a position where control of production is almost impossible. Regardless of what the demand may be from the refining industry, the natural gasoline industry is forced to treat natural gas production for the recovery of gasoline. The fact that next winter will probably see a material gain in natural gas utilization, augmented by the completion of long-distance transmission lines, will undoubtedly result in a material increase in the production of natural gasoline.

The only hope for the natural gasoline manufacturer to get a favorable break in the market lies with the ability of the refiner to improve the gasoline supply situation. Improvement in the general gasoline market will undoubtedly cause an increased demand for natural gasoline that will be reflected by a moderate upturn in natural gasoline prices. The fact that potential supplies of natural gas are increasing, with demand growing by leaps and bounds, is exerting

(Continued on page 156)

TABLE 6
Important Changes in Field Developments

	Completions		Oil Wells		Initial Production	
	1930	1929	1930	1929	1930	1929
Oklahoma City	237	7	221	1	2,228,328	6,565
Pottawatomie	92	281	74	231	32,527	194,316
Seminole . ..	349	323	267	233	317,555	175,955
Darst Creek ..	174	...	157	...	280,766	.....
Barbers Hill .	62	24	56	18	46,039	26,140
Humble	47	7	36	7	41,472	21,193
Pettus	18	...	18	...	5,400	.....
Refugio	111	23	81	11	45,939	4,945
Spindle Top .	46	14	31	11	18,322	12,995
Gray County .	125	88	107	75	96,365	82,045
Van Zandt ...	40	1	40	...	160,850	.....
Ector County	39	...	37	...	23,990	.....
Pecos	95	53	89	42	74,590	276,915
Winkler . ..	3	139	3	127	1,090	499,505
Young County	429	252	210	119	49,362	4,100
Muskegon, Mich.	15	216	10	157	975	68,716
McPherson County . ..	107	6	76	2	89,229	510
Sedgewick County . ..	39	87	20	54	7,868	39,695
Union County, Ark.	33	75	27	42	656	13,734
Wildcats— No. La. . ..	201	48	89	7	27,331	3,572
Long Beach .	90	125	90	123	84,910	109,687
Sante Fe Springs . ..	217	190	217	190	211,027	612,087
Elwood	11	4	11	4	39,758	17,200

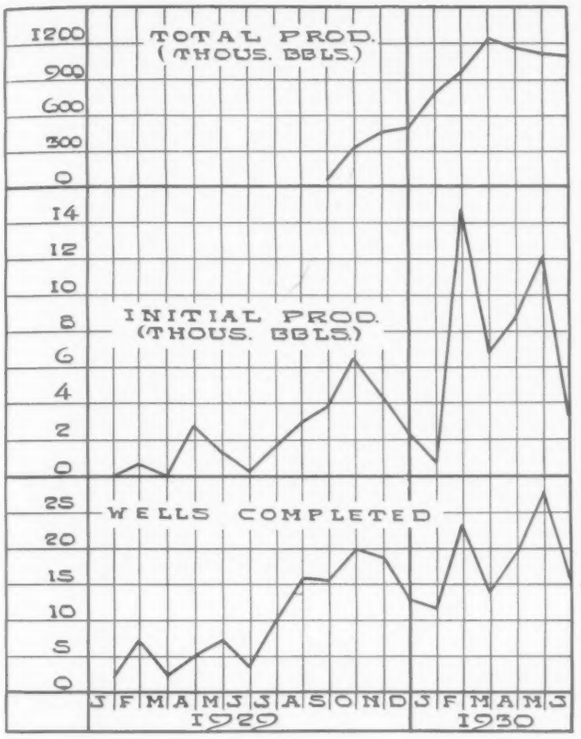


FIGURE 8
Field development of the Refugio field, Refugio County, Texas

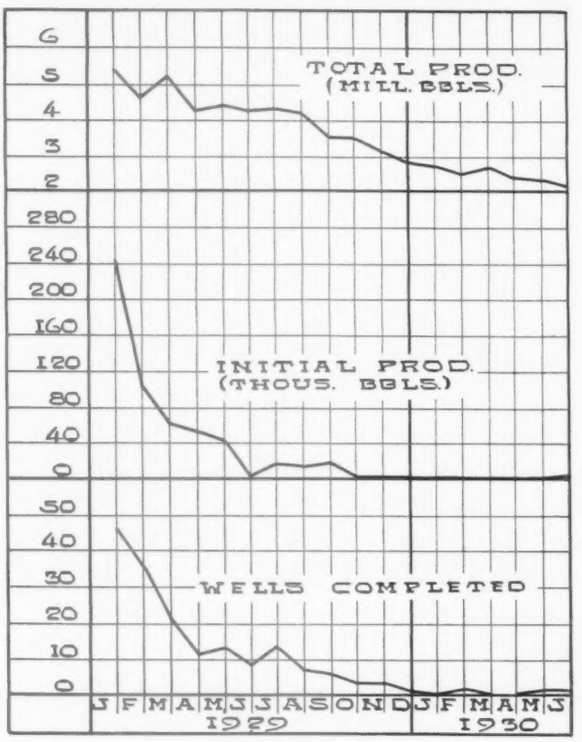


FIGURE 10
Field development of Hendrick pool, Winkler County, Texas

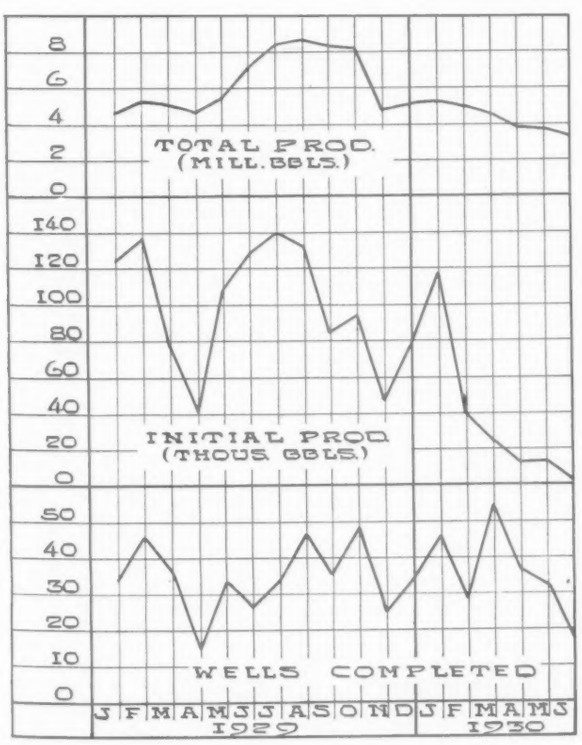


FIGURE 9
Field development at Santa Fe Springs, California

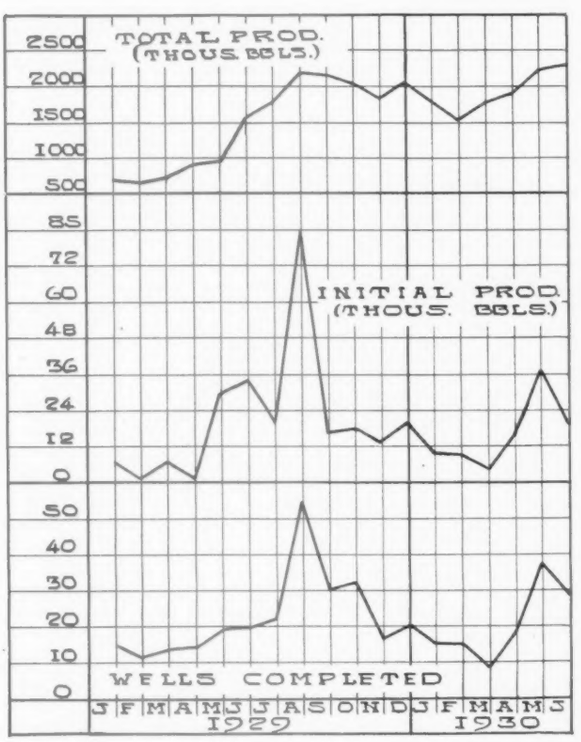
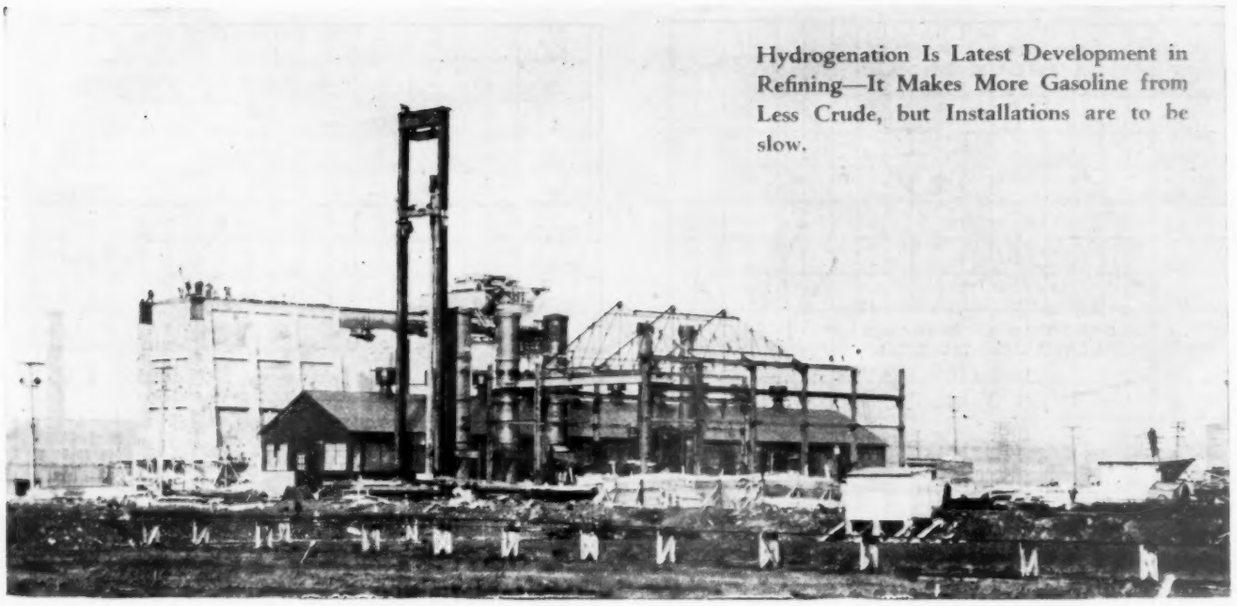


FIGURE 11
Field development of Gray County, Texas



Hydrogenation Is Latest Development in Refining—It Makes More Gasoline from Less Crude, but Installations are to be slow.

Refinery Expansion Provides *Additional* Crude Outlet

By GEORGE REID
*Associate Editor, The Refiner and Natural Gasoline Manufacturer**

EXPANSION in the refining industry continues to increase this year at a rate comparable to that reported at this time last year with an accompanying enlargement of crude oil consuming facilities. The expansion program entered into bp the industry about two years ago, which was apparently justified at that time, is continuing at such a rate that from a strictly economic viewpoint, based on present gasoline needs, it is not now justified. The industry is, however, becoming rapidly equipped with facilities which will enable it to meet the growing demand for motor fuels, confidently expected.

On the completion of each new refinery there is provided an additional outlet for crude; and in each of the eight major refining districts of the United States there is some additional crude consuming installations. This is not confined to new refineries alone, but involves a great many expansion programs engaged in by many of the larger refiners who have doubled capacity or are now going to. The present construction program of the industry will apparently extend over the next year or two, according to present indications. Much of the new construction work will occur with the larger or major companies in the replacement of more or less obsolete equipment through such means as the building of two-stage atmospheric-vacuum units of large capacity, more cracking units of improved type and lately developed processes such as the Hydrogenation system. This latter process is to be adopted by a number of large companies within the next two years.

New Refineries

During the year 1930 there have been 13 refineries erected or now under construction with eight more plants proposed. New plants building will add a total of 24,250 barrels capacity to the present 3,634,825 barrels total rated operating capacity of the industry. This compares with 35,500 barrels of new refining capacity being added on June 1, 1929, as reported in an analysis of conditions in the industry appearing in The Oil Weekly, issue of July 26, 1929, page 212. The following refineries have been erected this year:

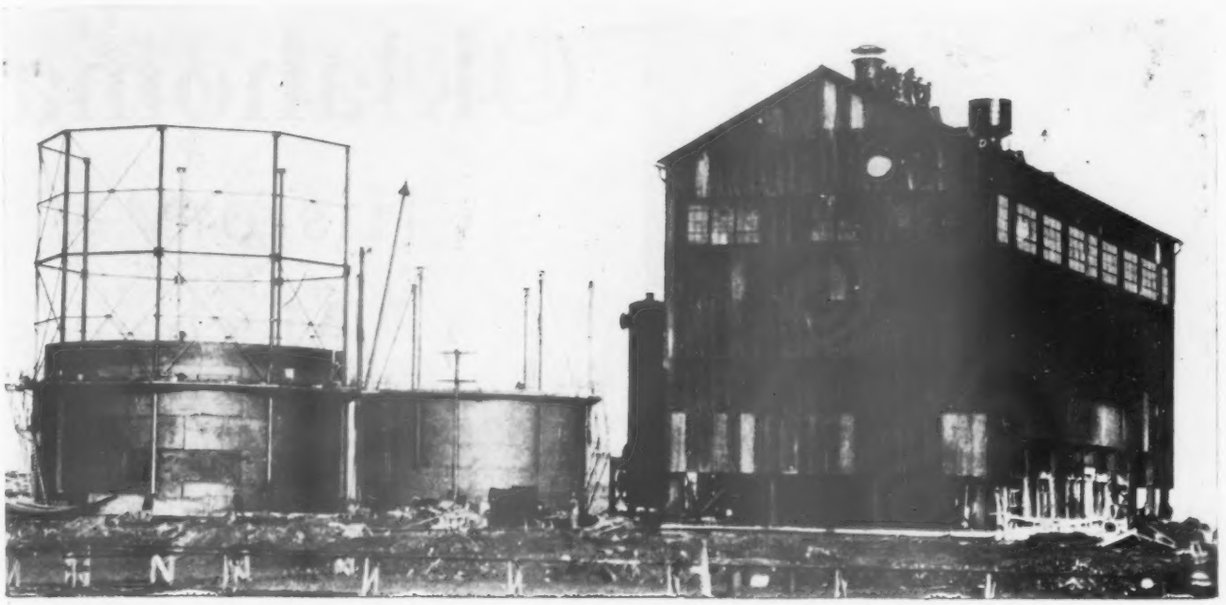
	Capacity Barrels
Allegheny-Arrow Oil Company, Canton, Ohio	1,500
Globe Oil & Refining Company, new plant, Lemont, Illinois	6,500
Laurel Oil & Refining Company, Laurel, Montana	1,500
Mexican Petroleum Corporation, Savanah, Georgia	5,000
Navajo Refining Company, Pampa, Texas	3,500
No-Sul. Production & Refining Company, Moran, Texas	100
Petroleum Refractionating Company, Moran, Texas	3,000

At the present there are six refineries in course of construction in this country, as follows:

	Capacity Barrels
Black Gold Refining Company, Oklahoma City	1,000
Continental Oil Company, Denver	2,000
Eastern Oil & Refining Company, Los Angeles	500*
Sterling Oil Company, Collins, Montana	700
Southland Refining Company, Olney, Texas	750
Union Gulf Corporation, Pittsburgh	3,000

* Estimated.

*A Gulf Publishing Company Publication.



In addition to the above there are eight refineries either proposed or announced, the erection of which is dependent upon conditions within the industry or individual company policy. Cities Service interests have under advisement the construction of a 20,000 barrel skimming and cracking plant in the Texas Gulf Coast district near Houston, as well as the possible acquisition or erection of refining properties on the West Coast. Tidal Oil Company has stated in its annual report that the erection of the 15,000-barrel proposed refinery near Houston, is contingent upon improved conditions within the industry. Texas Pacific Coal and Oil Company is reported to be contemplating a refinery near Lubbock, Texas, and Shell Petroleum Corporation is likewise reported to be considering refinery erection on the eastern seaboard. Grayburg Oil Company, San Antonio, plans a new refinery either at its home city or near Corpus Christi. Houston Oil Company has plans for a new plant at Corpus Christi in connection with its tank farm and shipping terminal now under construction. Skelly Oil Company has announced plans for the construction of a refinery near Pampa, Texas. Union Gulf Corporation is reported to be contemplating construction of another Eastern refinery at Cincinnati, in addition to its Pittsburgh plant and the doubling of capacity of the recently acquired Paragon Refining Company refinery at Toledo, Ohio.

Foreign Plants

Five new refining installations have been placed under construction during the first half of this year adding 17,000 barrels capacity to the industry's total. Three of these plants are being erected in Canada. Shell Oil Company of Canada is building a 4,000-barrel plant near Vancouver, British Columbia, at which point Seaboard Oil & Refining Company has also been building a plant of the same capacity. At Petrolia, Canadian Oil Company began construction of a 1500-barrel plant early this year.

In Japan Associated Oil Company and the Mitsubishi interests are erecting a 4000-barrel refinery near Tokio. Another 4000-barrel plant is under construction at Teneriffe, Canary Island, for the Espanola de Petroles.

The Russian government proposed the erection of a 20,000-barrel refinery near Moscow, to be completed during the 1932-33 operating year. The Colombian government (South America) is also considering the construction of a 2000-barrel plant at Buenaventura. In France, at Bordeaux, Standard Oil Company of New Jersey, Atlantic Refining Company and the Gulf Oil Corporation, plan joint construction of a plant estimated at 10,000 barrels capacity. Also, at Bordeaux Societe de Raffinerie de Petroles is to build a 3000-barrel plant.

The expansion of refining facilities in foreign countries may influence the exportation of American crude petroleum to some extent or many aid in the consumption of South American crude, much of which is now being imported for processing in American refineries.

Hydrogenation

Refineries in all of the eight refining districts of this country continue to expand their cracking facilities. This is especially true of the larger refining companies whose demands from premium anti-knock motor fuel has been increasing steadily. A survey on June 1 indicated that 30 cracking units were under construction in this country, and that another 20 units were contemplated by various companies. This work includes both liquid and vapor phase processes, as well as the construction of hydrogenation units under license from Hydro Patents Company of Delaware. This organization is a holding company for the rights of Standard Oil Company of New Jersey and I. G. Farbenindustrie Aktiengesellschaft of Germany.

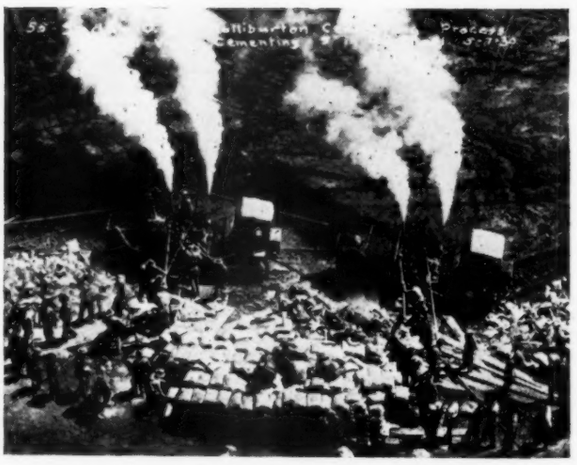
Much interest in the hydrogenation process is manifest by the membership of the stockholders list of Hydro Patents Company, as the 17 companies represented have a total daily crude running capacity of 2,363,700 barrels, which figure is 80 per cent of the total rated refining capacity of the United States.

The shares of Hydro Patents Company are held by the following United States refining interests: Atlantic Refining Company, Barnsdall Corporation, The Cities Service Company, Continental Oil Company, Mid-Continent Petroleum Corporation, Pure Oil Company, Shell Union Oil Company, Sinclair Refining Company, Skelly Oil Company, Standard Oil Company of California, Standard Oil Company (Indiana), Standard Oil Company of New Jersey, Standard Oil Company of New York, Standard Oil Company (Ohio), The Texas Company, Union Oil Company of California and Vacuum Oil Company .

Representatives of practically all of the interested companies are now in Germany making an intensive study of the work being done by the I. G. Farbenindustrie on the hydrogenation process there. The hydrogenation process marks the first substantial move toward the application of the basic principles of chemical synthesis in the petroleum industry. Its advantage over cracking lies in the fact that it is a constructive rather than a destructive process, and through the injection of hydrogen secures approximately 100 per cent conversion of the original oil into gasoline or other products of more value.

Oklahoma

History—Mechanics



Areal view of cementing operation

SEE SPECIAL MAP SUPPLEMENT FOUND IN THIS ISSUE

SYSTEM	FORMATION		THICKNESS	TYPE OF ROCK
QUATERNARY	Recent		0–60	Alluvium, sand, and clay
PERMIAN	Duncan ss.		50±	Massive red sandstone
	Hennessey sh.		650±	Red shales
	Garber ss.		300±	Massive red and orange sandstone, interbedded with thin red shales
	Wellington fm.		500±	Red sandstone with interbedded shale
	Stillwater fm.*		800±	Red and gray sandstones and red shales
PENNSYLVANIAN	Pontotoc group		1,350±	Red and brown shales with a few thin limestones
	Pawhuska fm.		350±	Light gray limestones with intervening shale
	Hoover series		600±	Brown and gray sands
	Oread ls.		100±	Limestone with a little sand and shale
	Tonkawa series		500±	Brown and gray shale
	Layton series		500±	Sandstone series with interbedded thin limestones
	Checkerboard ls.		90±	Limestone with small shale break
	Uncorrelated sec.		700±	Dark shales
	Oswego ls.		40±	Thin limestone with interneving shale
	Cherokee sh.		100-300	Dark shale with few limestones and sandstones; "Prue Sand" near top.
				"Detrital Zone"
MISSISSIPIAN	Mayes ls.		0–35	Gray cherty limestone
	Woodford sh.		0–60	Black shale, with chert
SILURO-DEVONIAN	Hunton fm.		0–350	Limestone, buff in color
ORDOVICIAN	Sylvan sh.		0–130	Green shale.
	Viola ls. (Fernvale)		0–40	Coarsely crystalline limestone, light buff in color
	Upper Simpson	Simpson Formation	0–200	Dense limestone with dolomite break below
	Wilcox sand horizon		0–250	Chiefly sand; may have shale interstratified; productive.
	Lower Simpson		0–490	Sandstone and shale members. Productive
CAMBRIAN	Arbuckle ls.		500	Chiefly dolomite. Productive

*NOTE: Formations down to the Stillwater outcrop.

Generalized Geological Section, Oklahoma County
Bulletin 40-SS, Oklahoma Geological Survey

OKLAHOMA'S greatest high gravity oil field is now 18 months old. During this comparatively short time it has set a number of records so far as Mid-Continent development is concerned and has established itself as one of, if not the greatest field of all times. It is the deepest commercial production in the Mid-Continent; it has had the highest actual potential of any single structure producing high gravity oil; it has required the heaviest equipment ever used in the Mid-Continent costing more money per well than three average Mid-Continent wells; and it has received perhaps more publicity than any other field on earth.

The Oklahoma City pool is located in townships 10, 11 and 12, ranges 2 and 3w, approximately in the geographical center of the state. It is about 40 miles northwest of the Greater Seminole area and a little over 60 miles almost due south of the Garber pool. The Atchison, Topeka & Santa Fe Railroad has spurs for handling equipment and moving crude and gasoline on the west side of the field, the St. Louis & San Francisco and Missouri, Kansas & Texas Railroads serve it in a like manner on the north. U. S. Highway 77, the main north-south route through Central Oklahoma, parallels the field from the southeast edge of Oklahoma City to its southern extremity and Avenue G passes east and west through the present center of development, connecting with State Highway 3, to Shawnee and Seminole. Both principal highways are paved and much of the roadway within the field is graveled and maintained.

The report presented herewith is divided into four main groups: Historical, Geological, Development, and Production. The data have been secured through the generous co-operation of the operating companies and the writer gratefully acknowledges their assistance. The geological maps were reproduced from Bulletin 40-SS, Oklahoma Geological Survey, by A. Travis, and much of the geological data have been secured from the same source.

The question of who is responsible, either directly or indirectly for the discovery of Oklahoma City structure, is one upon which much of the information has been conflicting. The writer believes that Mr. Travis[1] has probably arrived at as nearly the truth of the matter as can be determined and the result of his investigation is quoted verbatim.

History of Early Development

"It very often happens that differences of opinion arise regarding the discovery of the structure of an oil field. The Oklahoma City field is no exception. I have been at some pains to endeavor to sift out the claims of different geologists who have been connected with the finding of the structure at Oklahoma City. The statements herewith represent my best judgment in the matter.

"The first well drilled for oil which reached a depth of over 500 feet was located one-fourth mile south of Spencer. The company which financed the well was organized by E. J. Streeter, a hardware merchant in Oklahoma City, who was

[1]A. Trabis, Bulletin 40-SS, Oklahoma Geological Survey.

City Field

Geology—

By FLOYD SWINDELL
Staff Representative

the moving factor of the organization. L. C. Hivick was the contractor. The well was drilled in 1903 and reached a reported depth of 2002 feet.

"From time to time other wells were drilled in Oklahoma and adjoining counties. Six wells drilled in Oklahoma County are reported in Bulletin 19, pt. 2, Oklahoma Geological Survey, published in 1917, (p. 365.)

"All these wells were drilled without geologic advice and for the most part were drilled by promoters and financed by local capital.

"The two geologists who first observed a favorable oil structure near Oklahoma City were probably Geo. D. Morgan and Jerry B. Newby. The exact dates when these observations were made seem to have been lost. Morgan says, 'In 1917 or 1919, and I cannot remember which year I worked out the structure at Oklahoma City.' Everett Carpenter, to whom Morgan referred me, says 'I am of the opinion that it was about 1917.' Jerry B. Newby, who also worked out the structure, says, 'My work north and northeast of Oklahoma City was done in the early part of 1919.'

"L. E. Trout, in the fall of 1919, made a reconnaissance of the area, 'Late in 1920 or early in 1921,' mapped an area in southern Oklahoma and northern Cleveland Counties in what is now the southern part of the Oklahoma City pool. This seems to have been the first structure map prepared of the region. With Trout were associated S. H. Woods, Claude Dalley and L. R. Trout. In 1925 a well located by Trout in Section 36-11n-2w, near the Cleveland County line was drilled to a depth of 4480 feet. Several minor shows of oil were reported.

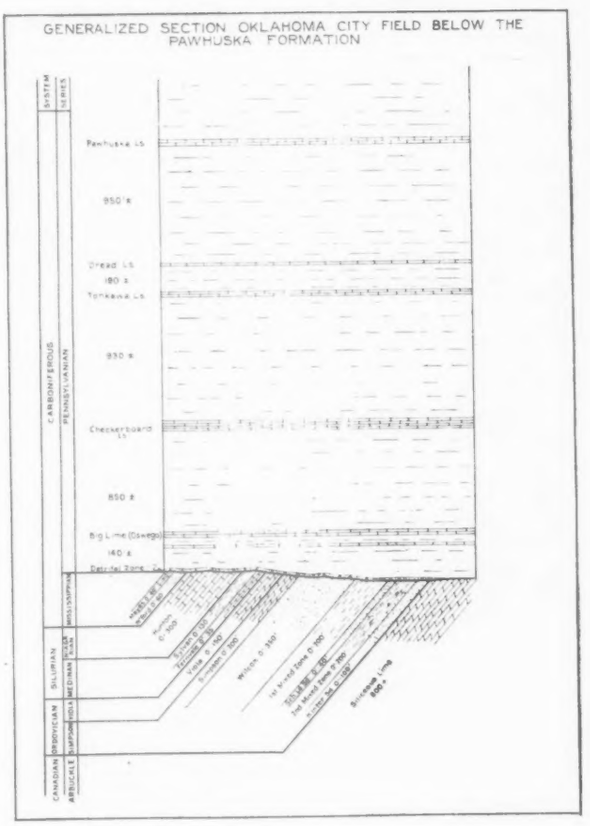
"In 1925 John R. Bunn worked out a surface high north of the State Capitol and a test (7180 feet) drilled by Cromwell-Franklin, Thompson No. 1, (SE¼ NE Section 15-12n-2w), found water in the Wilcox. This well had several minor shows in shallower horizons.

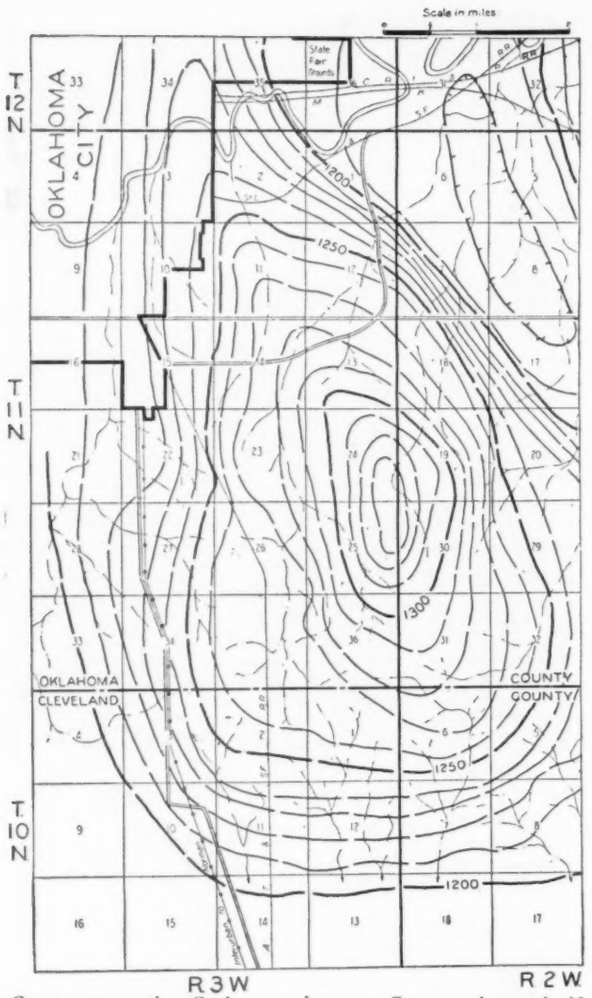
"E. A. Paschal, in 1926, while employed by Coline Company, traced the Hennessey-Garber contact and recognized the presence of a fold south of Oklahoma City. Upon the recommendation of C. T. Moore, then chief geologist for the company, three leases were purchased in the area, all of which are now producing.

"So the presence of a structure lying north, northeast, and southeast of Oklahoma City has been a matter of geologic knowledge for several years, and a number of geologists not mentioned herewith have at various times noted the structure.

"In 1927 Dr. G. E. Anderson, working independently while doing reconnaissance work for Indian Territory Illuminating Oil Company, reported a southward projecting nose on the Hennessey-Garber contact, and it is shown in the surface geologic map accompanying this report. Following Anderson's report, the detailed geology of townships 10 and 12n, 2 and 3w, was structurally mapped for the geologic department of Indian Territory Illuminating Oil Company in February,

First head of mud — cleaning itself





Contours on the Garber sandstone. Contour interval, 10 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

1928, by C. L. Wagner, under the supervision of J. H. Derden and C. W. Roop; and this work was approved by R. J. Riggs, chief geologist.

"Indian Territory Illuminating Oil Company then blocked approximately 10,000 acres on this structure. A location was made in the SE SE Section 24-11n-3w, and drilling began in June, 1928. This well had several showings, the most important ones being 3997 to 4012 feet where 25,000,000 cubic feet of gas was encountered, and another at 4805 to 4816 feet where 47,000,000 cubic feet of gas was encountered. Passing out of the Pennsylvanian rocks at 6100 feet, the well went into Ordovician and was completed as a producer of approximately 5000 barrels of 39 degree oil per day, at a depth of 6535 to 6498 feet in a porous dolomite. This well was called the I. T. I. O.-Foster, Oklahoma City No. 1. This well has since passed the 1,000,000 barrel mark and is still making about 370 barrels per day. This producer, completed December 4, 1928, started a tremendous drilling campaign and at this date (May, 1930) there are more than 200 oil and gas wells in the Oklahoma City area, with a potential production of over 1,000,000 barrels per day."

GEOLOGICAL

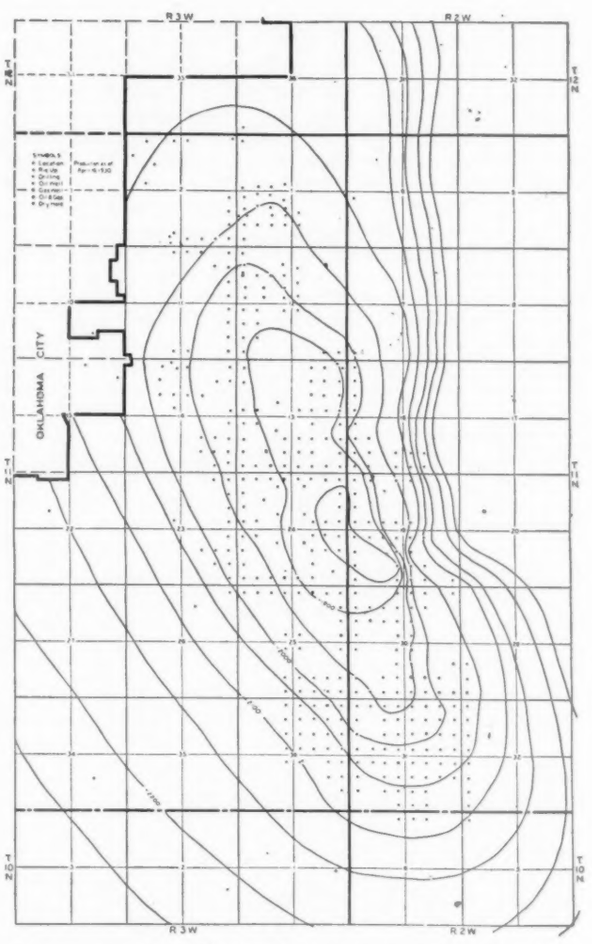
Surface Formations

The surface rocks of Oklahoma County belong to the Enid Group of lower Permian age. The Group is divided into six members, namely Chickasha, which does not outcrop in Oklahoma County; Duncan sandstone, found only in the southwestern corner of the county; Hennessey shale, which covers the western one-third of the county; Garber sandstone, the middle one-third of the county; Wellington formation, the eastern one-third; and Stillwater formation, which is below the surface but outcrops to the eastward in Lincoln County. The Chickasha member is the youngest and Stillwater the oldest. These formations have a general north-south strike and dip to the west at the rate of approximately 30 to 35 feet per mile. No unconformities have been noted within the Group. Much of the surface is covered with alluvium, unconsolidated gravels, and wind-blown sand, which in places, obscure the contacts between members of the Enid Group.

The Stillwater member of the Enid Group is composed of a series of red and gray sandstones and red shales with a basal limestone believed to be the cottonwood. Throughout the Mid-Continent geologists have difficulty in recognizing the exact contact between Permian and Pennsylvanian rocks. In the Oklahoma City area neither the top nor the base of the Stillwater member have been accurately mapped and the exact thickness of the formation is not known. However, it is believed to be about 800 feet thick based on the cottonwood lime correlation, the base of which has been used by the United States Geological Survey as the Pennsylvanian-Permian contact.

Pennsylvania

Although a large amount of study has been devoted to well cuttings and samples have been carefully taken, authorities differ as to how the Pennsylvanian section should be sub-divided into its formations. Many of the beds vary lithologically and as to thickness; and in the lower part of the section there are several beds which either do not occur in the outcrops or subsurface sections of other areas or whose characteristics have been so changed as to make them beyond recognition.



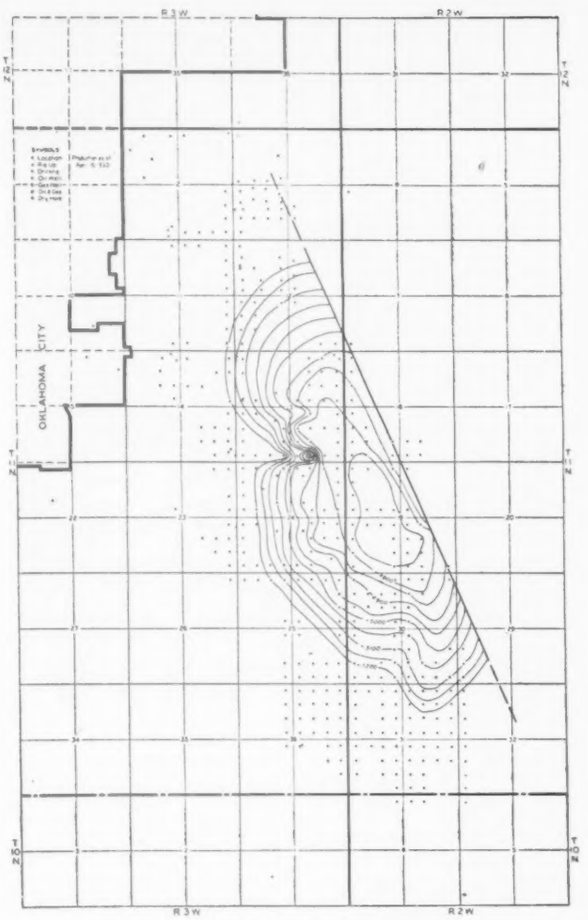
Contours on top of the Pawhuska limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

In general, the rocks of the Pennsylvanian section are composed chiefly of shale with about equal amounts of sandstone and limestone. In the Oklahoma City section a quantitative analysis reveals 75 per cent shale, 13 per cent sandstone, and 12 per cent limestone. Based on a tentative correlation as to the Pennsylvanian-Permian contact, the section is from 4000 to 4100 feet thick and is encountered at an average depth of approximately 2000 feet. No attempt is made herein to discuss each formation of the system. Further information may be obtained by reference to Bulletin 40-SS, Oklahoma Geological Survey.

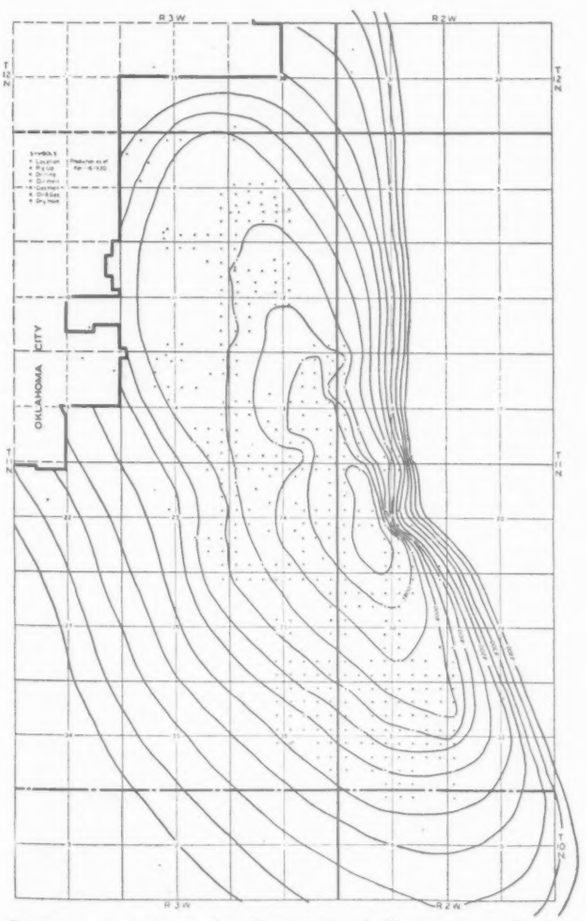
The most important of the Pennsylvanian sub-divisions are the Tonkawa and Layton Series because of their potentian possibilities as oil and gas producers, and the Checkerboard limestone because of its regularity and persistency which makes it the best horizon upon which to base structural contours.

Tonkawa Series—The Tonkawa series which is encountered at approximately 2400 feet below the top of the Pennsylvanian, is composed principally of brown and gray shales with limestone members at the top and several loosely cemented, fairly porous, buff colored angular sands below. The limestones are drab gray in color, finely crystalline, intercalated with dark brown clay shale. The discovery well found considerable amounts of gas in both the upper and lower parts of the series.

Layton Series—Directly underlying the Tonkawa is the Layton series which is made up of thin platy limestones white to drab in color, light gray arenaceous shales and thick beds of sand. The sands are quartzose massive, and well-cemented, composed of subangular, well-assorted grains. The upper part of the series contains gas and the lower has had oil shows. Both the Layton and Tonkawa have good possibilities as producers of gas and it is likely that they will be exploited as soon as the rush for production in the lower hirizons is over.



Contours on top of the Arbuckle limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)



Contours on top of the Checkerboard limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

Checkerboard Limestone—The Checkerboard limestone comprises essentially three limestones, light gray to dark medium to finely crystalline, and slightly porous, separated by thinner beds of shale. The total thickness averages around 90 feet.

"Detrital Zone"

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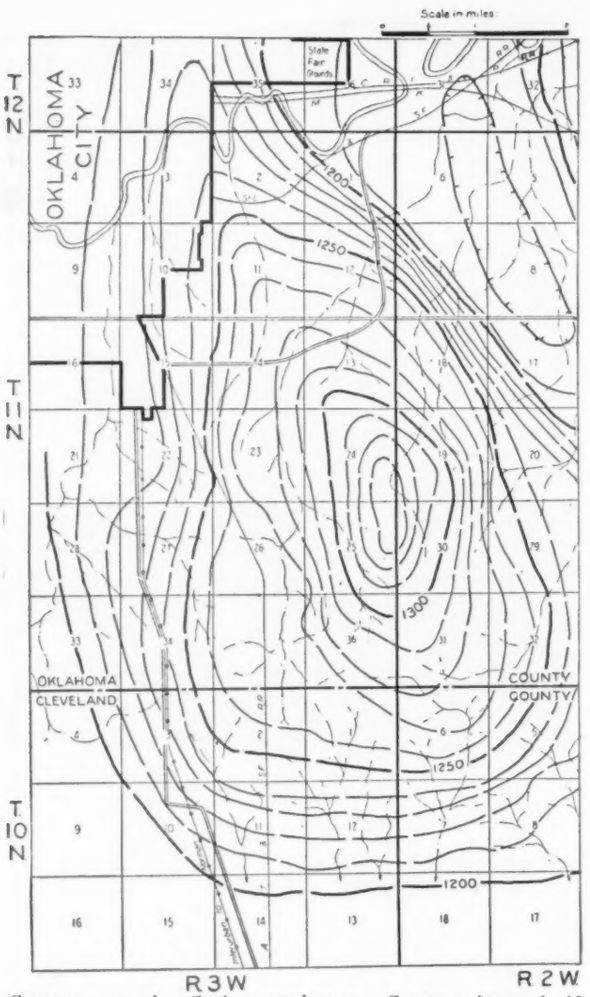


Contours on the Garber sandstone. Contour interval, 10 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

1928, by C. L. Wagner, under the supervision of J. H. Derden and C. W. Roop; and this work was approved by R. J. Riggs, chief geologist.

"Indian Territory Illuminating Oil Company then blocked approximately 10,000 acres on this structure. A location was made in the SE SE Section 24-11n-3w, and drilling began in June, 1928. This well had several showings, the most important ones being 3997 to 4012 feet where 25,000,000 cubic feet of gas was encountered, and another at 4805 to 4816 feet where 47,000,000 cubic feet of gas was encountered. Passing out of the Pennsylvanian rocks at 6100 feet, the well went into Ordovician and was completed as a producer of approximately 5000 barrels of 39 degree oil per day, at a depth of 6535 to 6498 feet in a porous dolomite. This well was called the I. T. I. O.-Foster, Oklahoma City No. 1. This well has since passed the 1,000,000 barrel mark and is still making about 370 barrels per day. This producer, completed December 4, 1928, started a tremendous drilling campaign and at this date (May, 1930) there are more than 200 oil and gas wells in the Oklahoma City area, with a potential production of over 1,000,000 barrels per day."

GEOLOGICAL

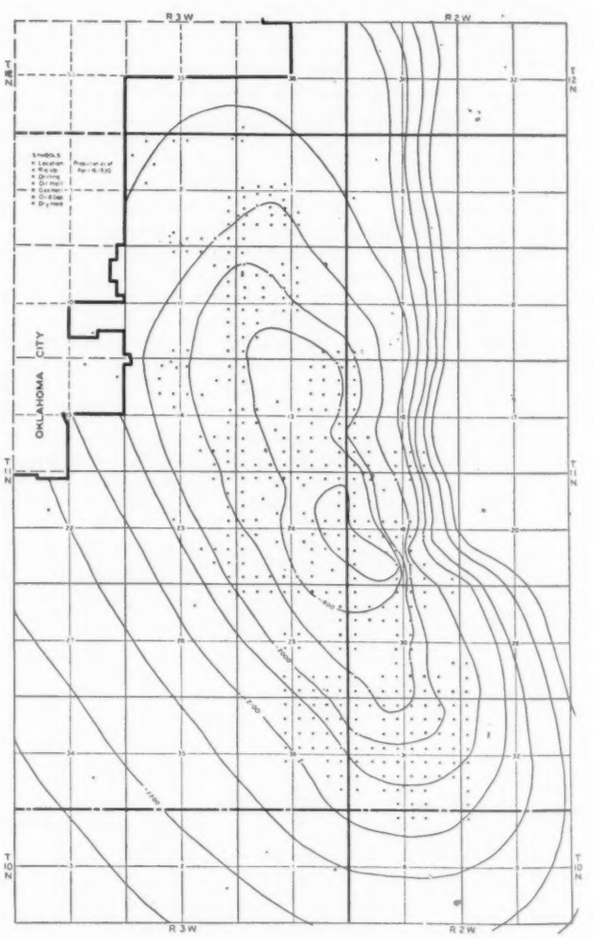
Surface Formations

The surface rocks of Oklahoma County belong to the Enid Group of lower Permian age. The Group is divided into six members, namely Chickasha, which does not outcrop in Oklahoma County; Duncan sandstone, found only in the southwestern corner of the county; Hennessey shale, which covers the western one-third of the county; Garber sandstone, the middle one-third of the county; Wellington formation, the eastern one-third; and Stillwater formation, which is below the surface but outcrops to the eastward in Lincoln County. The Chickasha member is the youngest and Stillwater the oldest. These formations have a general north-south strike and dip to the west at the rate of approximately 30 to 35 feet per mile. No unconformities have been noted within the Group. Much of the surface is covered with alluvium, unconsolidated gravels, and wind-blown sand, which in places, obscure the contacts between members of the Enid Group.

The Stillwater member of the Enid Group is composed of a series of red and gray sandstones and red shales with a basal limestone believed to be the cottonwood. Throughout the Mid-Continent geologists have difficulty in recognizing the exact contact between Permian and Pennsylvanian rocks. In the Oklahoma City area neither the top nor the base of the Stillwater member have been accurately mapped and the exact thickness of the formation is not known. However, it is believed to be about 800 feet thick based on the cottonwood lime correlation, the base of which has been used by the United States Geological Survey as the Pennsylvanian-Permian contact.

Pennsylvania

Although a large amount of study has been devoted to well cuttings and samples have been carefully taken, authorities differ as to how the Pennsylvanian section should be sub-divided into its formations. Many of the beds vary lithologically and as to thickness; and in the lower part of the section there are several beds which either do not occur in the outcrops or subsurface sections of other areas or whose characteristics have been so changed as to make them beyond recognition.



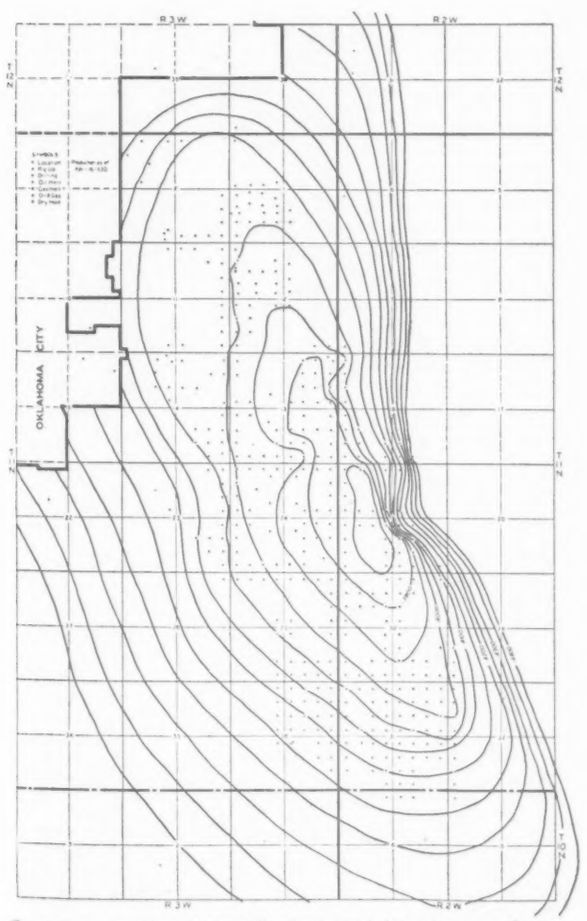
Contours on top of the Pawhuska limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

In general, the rocks of the Pennsylvanian section are composed chiefly of shale with about equal amounts of sandstone and limestone. In the Oklahoma City section a quantitative analysis reveals 75 per cent shale, 13 per cent sandstone, and 12 per cent limestone. Based on a tentative correlation as to the Pennsylvanian-Permian contact, the section is from 4000 to 4100 feet thick and is encountered at an average depth of approximately 2000 feet. No attempt is made herein to discuss each formation of the system. Further information may be obtained by reference to Bulletin 40-SS, Oklahoma Geological Survey.

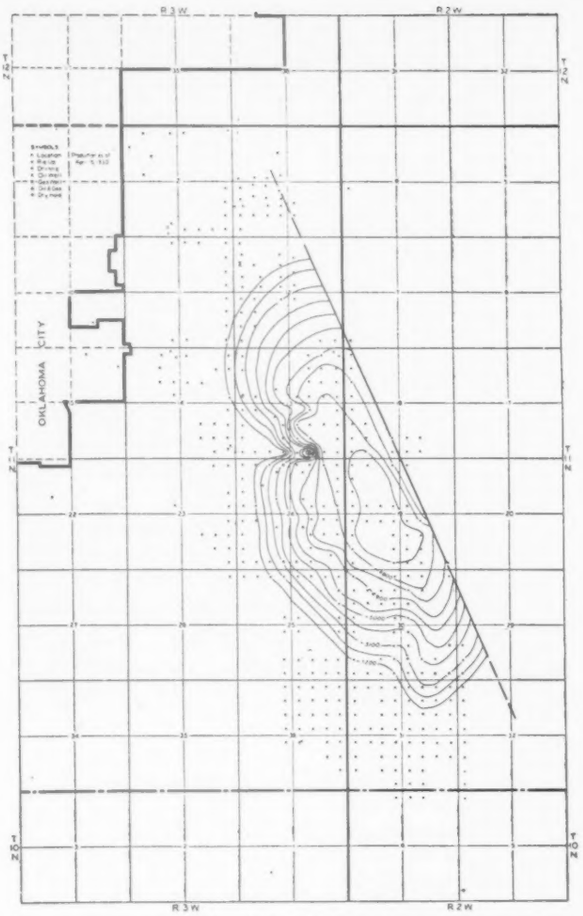
The most important of the Pennsylvanian sub-divisions are the Tonkawa and Layton Series because of their potentian possibilities as oil and gas producers, and the Checkerboard limestone because of its regularity and persistency which makes it the best horizon upon which to base structural contours.

Tonkawa Series—The Tonkawa series which is encountered at approximately 2400 feet below the top of the Pennsylvanian, is composed principally of brown and gray shales with limestone members at the top and several loosely cemented, fairly porous, buff colored angular sands below. The limestones are drab gray in color, finely crystalline, intercalated with dark brown clay shale. The discovery well found considerable amounts of gas in both the upper and lower parts of the series.

Layton Series—Directly underlying the Tonkawa is the Layton series which is made up of thin platy limestones white to drab in color, light gray arenaceous shales and thick beds of sand. The sands are quartzose massive, and well-cemented, composed of subangular, well-assorted grains. The upper part of the series contains gas and the lower has had oil shows. Both the Layton and Tonkawa have good possibilities as producers of gas and it is likely that they will be exploited as soon as the rush for production in the lower hirizons is over.



Contours on top of the Checkerboard limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)



Contours on top of the Arbuckle limestone. Contour interval, 50 feet. (Bulletin 40-SS, Oklahoma Geological Survey)

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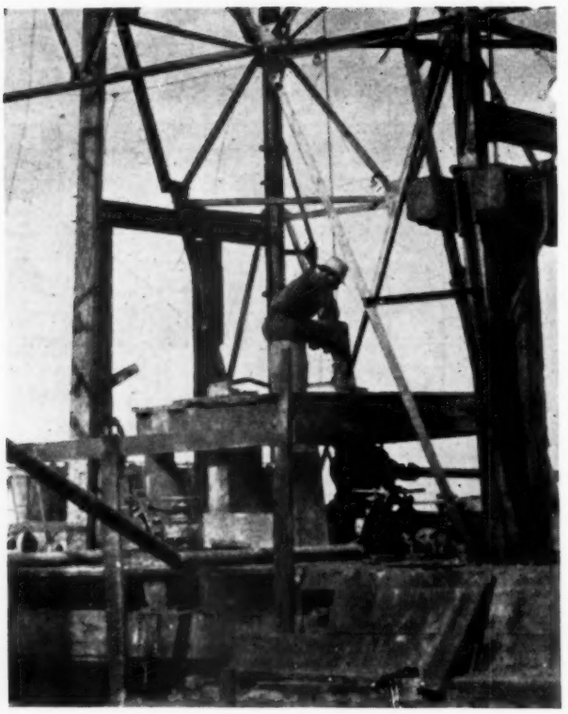


Usual method of bailing in

conglomerate. The geological departments of several of the companies are correlating this zone in the top of the Simpson formation and probably as many others still hold to the original belief. The term "Detrital Zone" has gained a wide usage but from a practical view point it is unimportant as to where it should be correlated.

Mississippian and Devonian-Silurian

The Mississippian section is represented by the Mayes limestone and Woodford shale and the Devonian-Slurian by the Hunton formation. All of these formations are encountered far out on the flanks of the fold being west of the productive limit and unimportant so far as the subsurface geology of the pool proper is concerned.

Ordovician

Sylvan shale and Viola limstone underlie the Hunton formation successively and have been encountered in only a few wells.

Simpson Formation—The Simpson formation underlies the Viola limestone unconformably. No well in the field has penetrated the entire section. In the Tidal-Slick, Martin 1, Section 13-13n-1w, the upper Simpson was 72 feet thick with a dense lithographic limestone 30 feet thick at the top and the remaining 42 feet composed of alternating limestone and buff dense dolomite.

The middle Simpson is represented by the Wilcox sand horizon which is composed of loosely bonded, frosted, and subangular white sand, with thin pyrite seams disseminated through it. A few wells in the south end of the pool are producing from the Wilcox and the extent to which production from this zone will swing around the southwest limb of the fold is problematical at this time.

The lower Simpson is sandy in the upper portion and is interbedded with bright green splintery shales and dolomite. Below this is a series of maroon and green shales with some sand probably the Tyner member. The basal part of the series is mixed sand, dolomite, and shales and has not been definitely correlated or subdivided.

Arbuckle Limestone—The top of the Arbuckle or siliceous limestone is composed of light brown to buff dolomite, highly porous, coarsely sucrose, and massive. In the type section in southern Oklahoma, it is composed of limestone at the top and dolomite at the base leading to the belief that production in the Oklahoma City area may be coming from the lower part of the formation.

Drilling Methods and Equipment

Each well in the field, except a few of the early tests, has been drilled and initially completed with rotary tools. The great depths at which production is obtained combined with extremely high rock pressures and hard formations not only have made the rotary method most adaptable, but have necessitated the design of a type of equipment to meet the conditions peculiar to this field. After initial completion, any deeper drilling is done with cable tools.

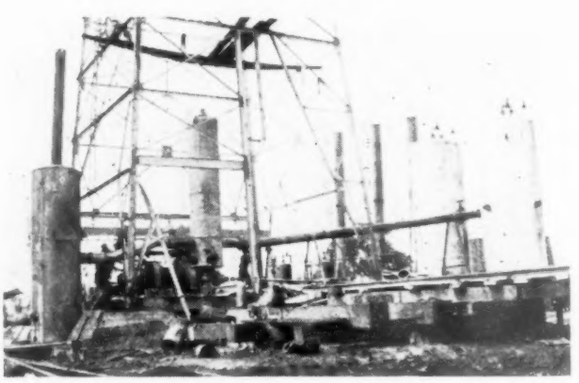
From the surface to the point at which the water string is set, 12 or 12¼-inch rock or disc bits are run on six-inch drill pipe. From that point to the 6⅝ or 7-inch casing seat, 8⅛ or 8⅝-inch disc or rock bits are run on four-inch drill pipe, and the wells are drilled in with 5¾ or 6¾-inch bits on three-inch drill pipe. Two thousand sacks of cement are used in setting the 6⅝ or seven-inch and seven days must elapse before the plug can be drilled. Assuming that the average diameter of the hole is not in excess of nine inches when drilling with 8⅛-inch bits, 2000 sacks of neat cement would fill behind the casing to a point approximately 1200 feet above the shoe, which in most instances would bring the top of the cement above the Tonkawa Series.

Considerable difficulty has been experienced in maintaining a drilling fluid which would at all times have the proper weight and colloidal qualities. Several well known admixtures have been used and operators have endeavored to maintain a weight of 10 to 14 pounds per gallon depending upon the part of the field in which the well is located. When drilling plugs the mixture of cement with the mud has a tendency to cause a frothy or feathered condition decreasing the weight per gallon to as low as seven or eight pounds. In this condition the mud seems to absorb gas rather than to exert pressure against it. Several hours of circulation are necessary to bring the weight up to normal requirements.

Completion methods have varied particularly since the northwest end of the pool has entered the town-lot area. Most of the wells completed prior to June 30 were allowed to clean themselves into the air blowing mud, rocks, and sand over the adjacent property. (See photograph, page 65). When this method is used no special preparations are made other than to remove all equipment not essential to bailing. Usually one boiler furnishes steam for bailing. When mud first starts slopping over the control head the bailer is laid down and the crew takes its position at the master-gate control lines which are made up of several joints of three-inch pipe. After all mud has blown out the upper gate is closed and production is turned into the traps.

Two improved completion methods, known as the mud separator and the "washing in", methods are now being experimented with in an effort to eliminate the wild flow

(Continued on page 131)



Layout for mud-separator method of completion

ROY E. LEIGH

Associate Editor of THE OIL WEEKLY engaged in a world wide oil survey. Mr. Leigh compiled the data on European fields found on the following pages after personally visiting all proven and prospective oil fields in Europe.

European Survey

THE trend toward internationalization of the oil industry lead THE OIL WEEKLY early in 1929 to undertake the presentation of facts, statistics and articles covering activities in oil fields throughout the world. In making this survey, THE OIL WEEKLY realized the importance of accurate, dependable information, and chose Roy E. Leigh as special foreign staff representative and associate editor, to accomplish this important undertaking.

Subsequently THE OIL WEEKLY published data compiled by Mr. Leigh, on the activities of oil fields in South America, which material appeared in the December 13, 1929, issue of this publication. The instant recognition and wide acclaim for this work further crystalized the publisher's desire to present like data, statistics and articles for oil field activities throughout the remainder of the world.

In the following pages THE OIL WEEKLY publishes data, statistics and articles by Mr. Leigh on oil field activities in Europe, those of the Russian Soviet excepted. Because unanticipated, additional time was required to adequately cover those European fields outside Russia, and to avoid incomplete coverage of important developments and activities in the Russian Soviet, data on Russian fields will be published in a later issue.

The author of these articles on European oil fields was chosen for this work because of his peculiar fitness for this work, and because of the need for journalistic excellence with a background of experience in the oil industry.

Mr. Leigh's active association with the oil industry dates back to before the World War when he served The Texas Company under the tutelage of Judge Wm. D. Bates. Except for a period spent with the expeditionary forces in France during the war, his connection with the industry has been continuous. From 1920 to 1926 he served Louisiana Oil Refining Corporation and associated interests at Fort Worth, Texas, and Shreveport, Louisiana, working his way up to responsible position, and obtaining intimate, first-hand information in all phases of the producing branch of the industry including scouting, construction, drilling, pipe line and marine transport, warehousing, statistics, appraisals, budgets, forecasts, estimates, etc. Following that Mr. Leigh gained experience in foreign operation through his connection with Trinidad Oilfields Operating Company, Ltd., one of the South American subsidiaries of Standard Oil Company of New Jersey. In this connection Mr. Leigh acted as secretary and assistant treasurer.

This European issue represents the partial completion of the second leg of a world-wide survey. It contains much of interest concerning producing, refining, and marketing practices in every country in Europe except Russia, where oil is produced. It is the most complete survey of European oil field activities ever published in the English language in one volume. All of it was gathered by Mr. Leigh personally, and in most cases with considerable difficulty because of the tendency toward secrecy, and because of language barriers. Cordial cooperation, however, has been given Mr. Leigh in this work, for which the publishers are truly grateful.

A careful reading of the following articles reveals that European oil field development has closely approximated American development in some instances, and exceeded it in others. There is revealed, however, the difference in development in European methods, which concerns the matter of secrecy as between different operators in the same field, and from this one realizes that interesting and highly valuable developments made in European oil fields have been accomplished through individual effort and without cooperative unit of action. Too, there is indicated the tendency to maintain old standards and retain old and obsolete equipment, to a degree more marked than in fields dominated by American practice and inventive genius.

European Trade Barriers

AMERICANS who were so recently engaged upon the discussion of legislative embargo on foreign petroleum would be interested in a study of situations which are the result of the operation of embargoes, tariffs, and other man-made laws governing the oil industry of Central Europe. For example, let us consider the operation of the Roumanian embargo on the exportation of crude oil in conjunction with the Austrian and Hungarian tariffs on the same commodity. All of these laws, presumably, are designed to foster domestic refining industries.

Roumania permits the exportation of refined products, but insists that crude oil be refined within the national boundaries. Austria and Hungary permit the importation of crude but restrict the importation of refined products by the imposition of heavy duties, their policies being to foster their own national refining industries. Trade adjusts itself to these artificial barriers, but at what cost?

Roumanian exporters, upon receipt of orders for crude oil from neighboring states, solemnly load their vessels with gasoline, kerosene, gas oil, and fuel oil, deliberately mixed in proportion to the purchasers' specifications. If the customer requires an oil with a gasoline content of 30 per cent, so be it; refined products are mixed in the proper proportion, and the shipment is dispatched in conformity with the law. Such mixtures are classed under the laws of Roumania as refined oils, since, in truth, they have been refined; but they enter Austria and Hungary as crude oil, as, in fact, they must be refined again. To be sure, the second refining process is economically inexcusable; but the entire cost of this duplicate manufacturing process is exceeded by the saving in taxes and duties; so the refiner makes a profit, the laws are obeyed, and everybody is happy—except, perhaps, the consumer.

While this unnatural state of affairs persists, Roumania's storage tanks are glutted with unsaleable excess production; her oil industry verges upon collapse; and Austrian and Hungarian consumers are forced to bear the burden of a second and wholly unnecessary refining process. The Soviets are the only people who derive any benefit from this condition, as meanwhile agents of the Naphtha Syndicate are busily engaged upon broadening and extending their participation in the Danubian market. Roumania has already paid a severe penalty in the loss of adjacent natural markets as a consequence of legislative meddling. Judging from recent increases in the movement of Russian oil over the route of the Black Sea and the Danube River and considering the advantages which have accrued to Persian and other producers during the embargo on Roumanian exports, as well as the prospect of new production from Iraq, one might fairly prophesy the ultimate eclipse of Roumania as a factor in the European and Eastern markets.—R. E. L.

Standard Office Building, The Hague

Ceptura Field

Roumania Proposes Curtailment of Production

A PARTIAL solution of Roumania's problem of overproduction is expected to result from a series of conferences now being held among government officials and leading oil operators. The government has announced a proposal to modify the terms of its embargo on the exportation of crude which was imposed for the purpose of fostering the domestic refining industry; and plans are also being drawn for the curtailment of production which now greatly exceeds refining capacities and domestic requirements.

The terms of the revised export regulations have not yet been announced, as it is understood that their promulgation is being held in abeyance pending the adoption of measures for the simultaneous limitation of production. It is not expected that the embargo will be lifted in its entirety, but only in proportion to the volume of excess production, as represented by the difference between current average production and total refining capacity. This excess now ranges from 15,000 to 22,500 barrels per day; and many refineries are facing the prospect of having to shut down or curtail their operations on account of the congestion of storage and transportation facilities. Total production averages around 123,000 barrels per day.

Discussion still continues among producers and officials of the Ministry of Commerce and the Bureau of Mines regarding the nature of restrictive measures to be applied. It is understood that the government proposes to pro-rata curtailment based on recent production averages. This scheme, however, meets with opposition from certain producers who have already reduced their output voluntarily, and who claim that they would thus be penalized unfairly as compared with competitors who have not yet made reductions.

It is expected that a satisfactory agreement will be reached; but, whether by mutual agreement or by the operation of natural and un-natural laws, it is believed that restriction must come, forthwith.

Crude values are depressed to 40 and 50 cents per barrel in some cases; and at least one major refiner has made an offer to give away fuel oil to any one who will remove it from the domestic market. Roumanian railways and pipe lines are operated as government monopolies, whose tariff rates are very much higher, for example, than those obtaining in the United States. Freight and taxes covering the shipment of fuel oil from the refining center to Constanta, Roumania's Black Sea port—a distance of 187 miles— approximate 47 cents per barrel, which is more than the commodity is worth at that point.

Nevertheless, oil operators in general have confidence in the intentions and good faith of the present government of Roumania, which is credited with the repeal of discriminative legislation which brought the nation into disrepute a few years back. Solution of the varied and complex problems confronting the industry and the government may be deferred, as political factors intervene, even as in the United States. Proposals include a reduction of freight rates and pipe line tariffs, and a substantial increase in pipe line and shipping facilities.

Some measure of relief is expected upon completion of intermediate pumping stations designed to increase the capacity of the 10-inch kerosene lines from Ploesti to Constanta from 11,250 to 18,750 barrels per day. Additional facilities for the loading of cargoes are also being installed at the Port. Two additional eight-inch and/or 10-inch lines are planned to be constructed at indefinite future dates. In fact, a contract for the construction of one of these lines has been offered a large American organization on 10-year credit terms.

Custom and Tradition Halt English Drilling

CAN England develop an oil industry at home?

That important question, 11 years after the discovery of oil and gas in commercial quantity at Hardstoft in Derbyshire, still remains to be answered; and in its solution, so it appears, political factors may come to bear with greater influence than natural geological conditions.

As regards natural and geological conditions we have these facts and opinions:

Facts

(a) Gas and oil of Pennsylvania grade were found in commercial quantity in the very first well drilled under the Defense of the Realm Act (Regulation 2AAA of January 16, 1918), by means of which points at issue between the Laborites, Conservatives, and Liberals, forming the war-time coalition government, were deferred for post-war decision. (b) We have it on the authority of H. P. W. Giffard, M. H., B. Sc., F. G. S., Technical Assistant to the Petroleum Department of the Board of Trade[1], that of 11 wells drilled under these regulations, "one well has produced over 1000 tons of oil and is still flowing, one well has produced seven tons of oil, four other wells have shown traces of oil, and five wells have been dry." (c) E. L. Ickes[2], a California geologist who, as a member of the staff of S. Pearson & Son, Ltd., had charge of exploratory drilling during its later stages and therefore had access to the various details of operation, summarizes the results of Britain's war-time search for a domestic supply of oil by saying that "of the 10 structures drilled upon, two yielded encouraging showings; three cannot be considered as having been adequately tested; and five produced dry holes, although in some of these small oil showings and gas were met." (d) As regards gas, Dr. A. C. Veatch[3], of New York, relates that "Three wells on different structures to the north of Hardstoft have encountered commercial gas in the Millstone grits." (e) Ickes, who, in the preparation of his paper, seems to have made a thorough search of English technical literature and to have found an abundance of references to the occurrence of oil running throughout recorded history, even unto Roman times. James Young, a contemporary of Colonel Drake, utilized oil from the Riddings colliery in Derbyshire and separated such fractions as kerosene, lubricating oil, and wax. "Young, believing that oil was derived from coal, experimented with Scotch torbanite, which gave somewhat enalagous products on distillation, and transferred his operations to Scotland and founded the oil-shale industry." Ickes found other references, too numerous to mention here, of the discovery of oil-bearing sands while prospecting for coal, and of the production of oil in such quantities as five barrels per day, 100 tons per annum, and even 100 barrels per day in connection with coal-mining operations.

Hardstoft 1, *discovery well of England. Oil is flowing into the tank*

Veatch states that the outbreak of the great war enabled him and his associates to carry out a long-deferred desire to see just what the numerous indications of petroleum in Great Britain really mean; and that "it was possible in a short time to present to Lord Cowdray the conclusion that the petroleum possibilities of the Midlands of England were of a most amazing and striking character." In the same paper, he states that "The Midlands of England contain large areas of important oil lands."

Ickes expresses the opinion that "The results achieved justifies the undertaking and expenditure incurred. Oil was proved; and, although it was not possible to extend and develop the findings brought forth by the drilling, on account of the limitations under which the work was done, the tests were of a comprehensive nature and will afford a valuable guide in future prospecting. In a country like Great Britain, with its large population, excellent transportation, ready oil market, mild climate, and other facilities, a small well is more apt to be a commercial proposition than a similar well in other countries."

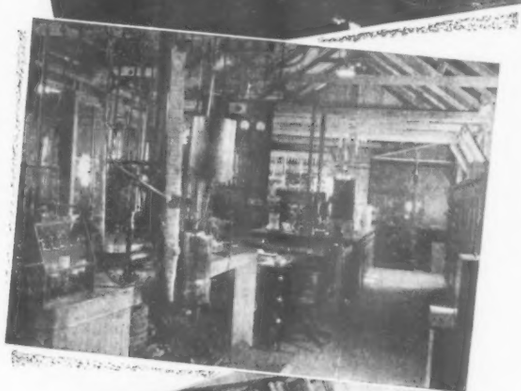
Dr. Arthur Wade, a prominent consulting geologist of London[4], gives it as his opinion that "To come to the conclusion that the first bore to be commenced under the government scheme for the purpose of seeking for oil in England struck the only large supply that exists, or can possibly exist, would be absurd. Such a borehole is but a pin prick on the surface

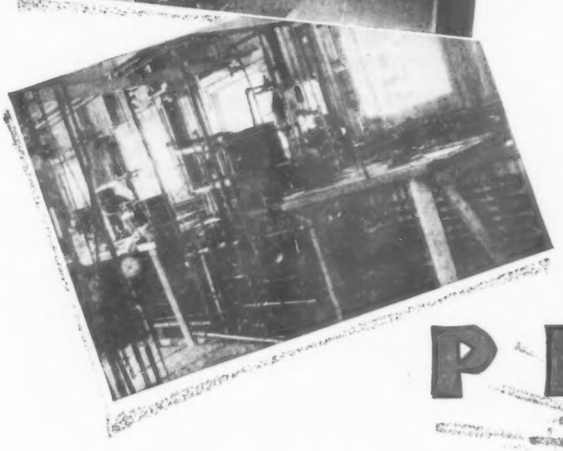
[1] "The Recent Search for Oil in Great Britain," a paper read before the Institute of Mining Engineers, Glasgow, June 12, 1923.

[2] "Recent Exploration for Petroleum in the United Kingdom," a paper read before the Tulsa meeting of the American Institute of Mining and Metallurgical Engineers, October, 1923.

[3] "Petroleum Resources of Great Britain," a paper read before the New York meeting of the American Institute of Mining and Metallurgical Engineers, February, 1920.

[4] "The Oil Well and Later Developments at Hardstoft, Derbyshire," a paper read before the One Hundred and Tenth General Meeting of the Institute of Petroleum Technologists on April 3, 1928.





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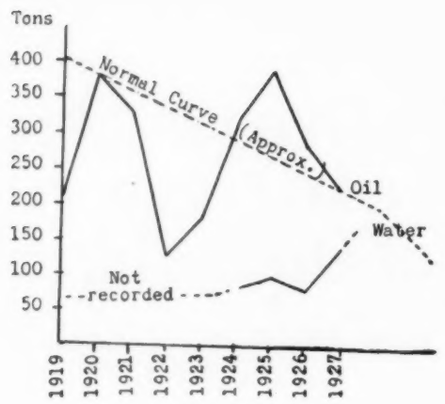

Production curve Mardstoft 1

From Wade, "The Oil Well and Later Developments at Hardstoft, Derbyshire"

of the country; and to imagine that such a pin prick discovered all that is to be found in the length and breadth of only the Northern Midlands would be to imagine a vain set of improbabilities. If my reasonings are correct it is almost certain that more oil is to be obtained, possibly in larger quantities than those already yielded by No. 1 Hardsoft, along the same fault plane and at the same horizon. There is no reason to doubt that similar accumulations exist in favorable situations elsewhere. . . .

"It appears to be certain, therefore, that accumulations of petroleum possibly of comparatively large dimensions remain to be discovered in England."

Dr. J. A. L. Henderson, another British authority, said in discussing Dr. Wade's paper that "There was, however, the record of a production of almost 20,000 barrels of high grade oil with remarkable persistence of flow, and he understood that the oil was still as highly charged with gas as at the beginning of the well's history. These facts pointed to some very considerable source of supply, and led one to believe that if it were only possible to continue the investigations a large deep-seated source might be found."

E. H. Cunningham Craig, another prominent British geologist, said at the same time that he was afraid that he must associate himself with the pessimists; but that the subject, however, is one of very great interest, and there is no saying whether in concealed structures they might yet find a locality in which the oil has still been preserved.

H. M. Caddell, of Grange, Linlithgow, in discussing the Giffard paper, said on behalf of the pessimists that: "It will be in the recollection of members that in the beginning of 1919 Mr. Theodore Sington communicated a paper to the Manchester Geological and Mining Society on "The Search for Petroleum in Derbyshire[5], and he concluded that there was not the slightest probability of a useful store of oil being found either there or elsewhere in the country. In the discussion which followed, Prof. W. Boyd Dawkins and other qualified authorities entirely agreed with Mr. Sington. In October, 1919, I communicated a paper on 'Oil Possibilities in Scotland[6]' and regretfully arrived at the same pessimistic conclusion from long acquaintance with the geological characteristics of the ground. My opinion was supported by Dr. B. N. Peach, of the Scottish Geological Survey, whose knowledge of Scottish geology is unrivalled, and by others who also spoke. At that time boring was only beginning, and the doleful prophets of evil were highly unpopular old croakers in the eyes of the non-geological British public. The oil-borings were mainly recommended by outsiders and American oil-drillers, and the bores in Scotland were founded on what I consider a false theory as to the origin of oil-shale."

Each and every one of these authorities who felt optimistic regarding geological conditions, however, felt it necessary to qualify his opinion regarding other factors likely to retard the development of a domestic supply of petroleum within the British Isles. Wade seems to have hit the nail on the head when he said that "there are difficulties in the way of a commercial search for oil in England which are in part practical and in part *psychological*[7]." . . . "It is quite likely that matters would be more difficult and prolonged with regard to leases for oil well drilling, for there are practically no *precedents*[7] to go upon."

. . . "Again, it is unfortunate from the point of view of the seeker for petroleum that the most favorable areas we know of at present lie in important coalfield areas and are, therefore, largely under the influence of the coal mining interests. American investigators did not find these interests too friendly and, in the present circumstances, powerful opposition to any attempt to prospect for fuel resources of a competitive character could quite naturally be expected in this quarter. Finally, if we assume that a lease has been obtained against every obstacle, we have to consider what must happen should the borehole pass through coal seams. At Hardstoft a pillar of coal 2½ acres in extent had to be left around the bore where it passed through the seam, and the coal owner had to be compensated for the loss of this coal. Consider a borehole likely to pass through three or four such seams, with an average thickness of, say, only three feet. The sum that would have to be paid out in compensation for what amounts to nearly 30,000 tons of coal at least, is sufficiently great to cast a cold douche over any optimistic seeker for oil, especially when the other risks attaching to this venture are considered.

"The conclusions I come to at the end of this chapter are that, although I am sure that accumulations of oil do exist in the Midlands of England, I am also sure that to look for them is not at present a commercial proposition. Some day, either when there is a dearth of fuels or in some case of national emergency, the search for oil in England may be commenced again."

Veatch explains that "The leasing of minerals on the large estates is a very complicated business, as the family solicitors have many forms and formalities that must be observed. In the case of the large estates, the principal revenues of which for several hundred years have been from coal leases, the average time between the agreemnt on terms for a coal lease and the signing of the same has been eight years."[8]

Veatch relates that the discovery well at Hardstoft, which is producing from a limestone formation at a depth of 3078 feet, was not "shot," as would have been done in America, first, because the transportation of nitroglycerine on the roads of England is not permitted, and, second, because, the war emergency being over, the question of the ownership of the oil had become acute.

It has been suggested that neither the classes nor the masses, nor either of the political parties now jostling for the spotlight position on the stage of British statecraft, would welcome the development of a domestic petroleum industry. Supporters of the old-line parties, whose incomes and campaign contributions are derived very largely from the coal-mining industry, are averse to any change. Laborites, many

[5]Transactions, Institution of Mining Engineers, 1918-1919, vol. lvii, page 25.

[6]Transactions, Institution of Mining Engineers, 1919-1920, vol. lviii, page 44.

[7]Italics are ours. Editor.

[8]Editor's Note: Another article illuminative of the British attitude toward matters of this nature was published in our issue of December 13, 1929, from which pertinent quotations are repeated here.

"The explanation is found in the difference in the habits of thought of the two peoples," i.e., British and American.

"The attitude of the (Trinidadian) people appears to be in direct contrast to that of civic and public bodies in America, where oil development is invariably welcomed and sought after."

"Sojourning American oil men are impressed with the belief that Trinidad people are enslaved to their lawyers."

"It seems probable that Trinidad's 'oil mining leases' may in the beginning have been copied or adapted from coal mining leases in England. At any rate, they have been found to be inapplicable to oil operations; hence the Holland survey, . . ."

"A standardized and printed form of lease contract, such as the old Producers 88, tried and tested in the crucible of the courts, and well-understood in the oil-producing states of America, could not be introduced in Trinidad, as it would be viewed with distrust and suspicion, particularly by the legal profession, with whose prerogatives it might interfere."

I AM THE SPIRIT OF ELECTRICITY

• I spring to life in whirring dynamoes to work the miracles of man, my master. My tasks are myriad. I am a tireless servant. I light the tiny filaments of a surgeon's lamp or grind a mile length string of steel into the earth on some distant lease. Subservient to man's will, I have lifted the burden of drudgery from the shoulders of humanity. I have widened man's horizon and given greater scope to his inventive genius. I turn the wheels of industry that his economic balance be preserved. I am the torch bearer ot civilization. I am the great emancipator. I am a presage of miracles to come. » » »

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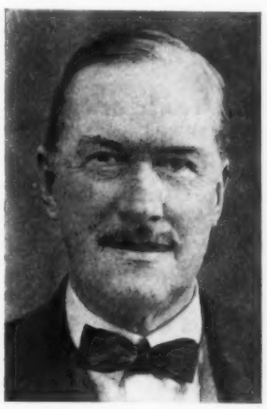

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of whose adherents earning only a few shillings per day in the mines, have already lost ground in economic competition with oil-well drillers who earn from $9 to $15 or more per day in the production of liquid fuel, are equally hostile toward the infant industry.

Furthermore, there is the question of nationalization, which represents one of the planks in the Labor Party's platform. Veatch explains that "In Great Britain, except in certain special areas, all minerals, except for gold and silver, belong to the surface owner . . . For years the Labor Party and extreme radicals have protested against the payment of royalties to landlords on coal. The government, therefore, introduced a bill taking over all the oil rights and providing for the payment of a small royalty[9] to the landlords, to safeguard the principle of compensation in case the coal mines should ever be nationalized. The provision of this bill, with respect to the payment of royalties to landlords, was defeated by a vote of 44 to 35 in a night session of the House of Commons on October 25, 1917, when most of the members were absent but when a group of labor members and extreme radicals were present.

"The compromise reached was that a bill should be passed declaring that no one could sink a test well for oil or gas in Great Britain without a license from the government, and the question of royalty and ownership would be dealt with after the war. . . . This legislation was passed in October, 1918."

Historical Record of the Hardstoft Well

As compiled by Giffard, Wade, and other authorities referred to in the accompanying article.

Location: Three-quarters of a mile east of Pilsley Station, Derbyshire.
Drilling Commenced: October 15, 1918.
Drilling Completed: May 27, 1919.
Total Depth: 3130 feet.
Initial Production: Flowing seven barrels; pumping 14 barrels.

At 3075 feet oil was met with apparently at the top of the Carboniferous limestone. A hard cap-rock about six inches thick was penetrated before entering the horizon. In an hour the oil rose 90 feet in the well, and was evidently coming up under pressure and accompanied by a certain amount of gas.

In the course of a day or two it rose to the top of the boring and overflowed slowly at the surface, a steady yield of approximately 50 barrels per week being obtained for a period of two years.

Drilling was continued for about 70 feet into the limestone without increasing production; the thickness of the porous bed from which the oil is obtained is about two feet.

In April, 1921, it was decided to make a pumping test, . . . and the test was stopped on July 24, 1921, after being in operation for 100 days. During this time the production was doubled, the well yielding an average of 14.6 barrels per day as against seven barrels per day by normal flow.

Pumping was not continued, as the government was not in a position to undertake the commercial production of oil, and the question of the ownership of the oil was at that time in dispute.

During 1921, . . . it was decided that operations should be closed down and that no further drilling should be undertaken by H. M. government.

After the partial repeal of the D. O. R. A., the Duke of Devonshire took the well over from the government. A license to conduct operations upon his own property was not, however, obtained until June, 1923.

In 1922, production has fallen to 974 barrels, ... Ickes and others did not regard this as a normal decline, and attributed the fall to the waxing up of the sand around the well. . . . On the advice of Mr. A. Frank Dabell and Dr. Henderson, the well was cleaned out as well as was possible in 1923, the result being a rapid rise in production during the years 1924 and 1925—the highest yearly yield being recorded in the latter year, that is to say in the sixth year of its life, which is again an abnormal feature. When the well was cleaned out it was found that not only had the well filled in to a depth of 25 feet, but it was half full of water, though it was reported

[9]This royalty was to be calculated at the rate of 9d per ton, or 2.3 cents per barrel.

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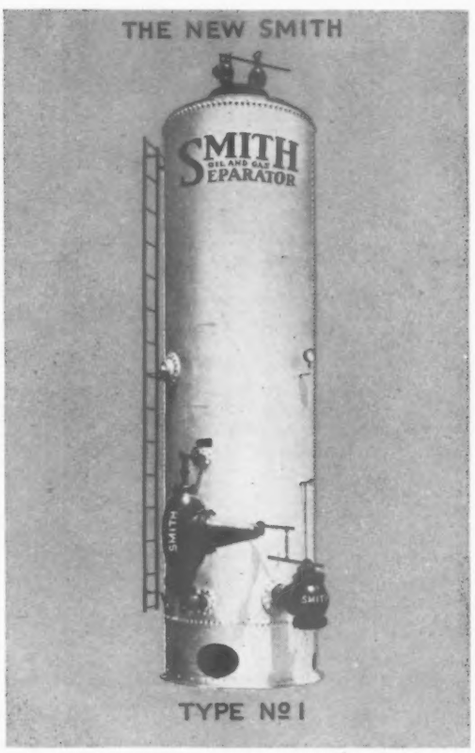

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to be quite dry when oil was struck, and the oil which first came in the well was quite free from water. It is thought that the water may be from a water sand, found at 1515 feet and not cemented off, and is now finding its way through a defect in the 10-inch casing near this level. Another possi-

Historical Record of the D'Arcy Well

Location: Two and one-half miles southeast of Dalkeith, Scotland.

Total Depth: 1820 feet.

Drilling Commenced: December, 1919.

Showings: 300,000 cu. ft. of natural gas from depth of 724 feet. Small shows of oil at 493, 615 and 1490 feet.

On May 6, 1922, at 1810 feet, oil was struck in a soft quartzose sandstone. Drilling was continued for about 10 feet below the point at which oil was struck, but without apparently increasing production.

When the oil was first encountered, it rose about 70 feet in the borehole, and by May 13, the column of oil had risen to a height of 320 feet.

In order to ascertain what production could be secured, a bailing test was made, starting on July 17, 1922, but the quantity of oil available was not sufficient to enable bailing to be continued for more than a few hours each day. It was found that a certain amount of water was coming in . . . .

Analysis of ardstoft Oil.

Gasoline	10 per cent
Kerosene	30 per cent
Light lubricating oil and wax	30 per cent
Heavy lubricating oil	30 per cent
Sulphur	42/100 per cent
Wax	3¼ per cent

Gravity, 40° Be. Paraffine base, containing naphthenes. Dark brown in color, resembling Pennsylvania crude.

Production Record Hardstoft Well.

Year	Bbls.
1919	2568
1920	2909
1921	2652
1922	974
1923	1415
1924	2425
1925	3016
1926	2177
1927	1749
*1928	606
Total	20,491

*Note: The well was closed down at the end of October, 1928. It will be re-opened during the summer of 1930.

Analysis of D'Arcy Crude

Product	Per-cent by Volume
Motor spirit and heavy naphtha	15.13
Kerosene and light gas oil	25.44
Gas oil	17.57
Lubricating oils	15.00
Paraffin wax	12.36

The oil proved to be of excellent quality, very similar to that at Hardstoft.

Record of Subsequent Drilling at Hardstoft

Hardstoft Well No. 2

Location: Six hundred feet west from No. 1 (discovery well.)

Drilling Commenced: May 16, 1924.

Total Depth: 3130 feet.

Showings: Showings of oil at 760 and 3056 feet; 20,000 cubic feet of gas at 370 pounds pressure at 1620 feet.

"It became evident that an unsuspected fault ran between Bores No. 1 and No. 2."

Hardstoft Well No. 3

Drilled by Anglo-American Oil Company (Standard Oil Company of New Jersey.)

Location: Six hundred feet north of east of No. 1.

Drilling Commenced: August 5, 1925.

Drilling Completed: June 8, 1926.

Total Depth: 3825 feet.

Showings: Gas at 400, 1812 and 1823 feet. Oil at 1500, 1509, 1900 and 1978 feet.

A PROVERBIAL HELL

Lies just ahead of the DRILLING BIT

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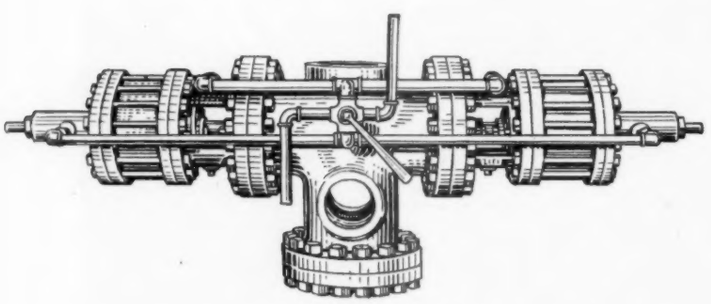

The action of this preventer is faster than the on-rushing high pressure. Its steel around steel grip is stronger than any well pressure yet encountered.

With lightening speed the steel rams are closed with a vise-like grip around the drill stem. The machined surfaces at top and bottom of the concave faces provide additional safety by preventing the passage of couplings or tool joints. These steel rams have a special packing that is designed to pack tighter as the pressure increases.

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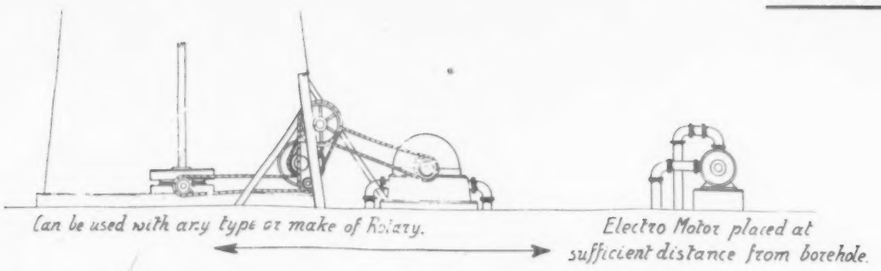


Roumanians Transmit Energy TO DRAW WORKS By Hydraulic Power

PETROLEUM engineers who would keep abreast of the progress of their profession will do well to keep their eyes on Roumania during the next decade, as important new inventions and mechanical methods may come from that source. Under present conditions, Roumania is a fertile field for the conception and development of new ideas; the situation includes all those factors which have been demonstrated as stimulants to progress.

Consider first the exchange of ideas, without which the oil industry of the English-speaking world might have developed in an unco-ordinated fashion along divergent lines, as in Germany and Poland. Opportunity exists in Roumania for discussion on the ground and exchange of ideas among engineers and practical men whose collective experience probably embraces every oil field in the world. There is scarcely a major organization in Roumania whose technical staff does not include men who have produced oil in every corner of the globe, as well as graduates of the best engineering schools in Europe and America.

G. P. Lehmann
Inventor of the Turbine Drive

Natural obstacles and conditions are sufficiently adverse to afford stimulus to the individual and call forth the best thought of which he is capable in grappling with new problems which arise from day to day as the local industry advances from primitive to modern methods. If operating conditions were not difficult, the engineers of the country might rock along with old methods and ideas borrowed from other fields, having no incentive to engage in original thought and creative effort. As it is, however, new and complex problems are encountered at every turn; and, as engineers and practical men from America, Venezuela, Germany, France, Poland, Roumania and other countries confer and exchange ideas for the solution of their varied problems, progress is certain to result.

European engineers, having hurdled their initial prejudices and discarded the fetters of tradition, may be expected to make additions and improvements to methods and machinery adopted from American practice; and, as they begin to apply themselves in this direction, important contributions to the further advance of the industry may be expected.

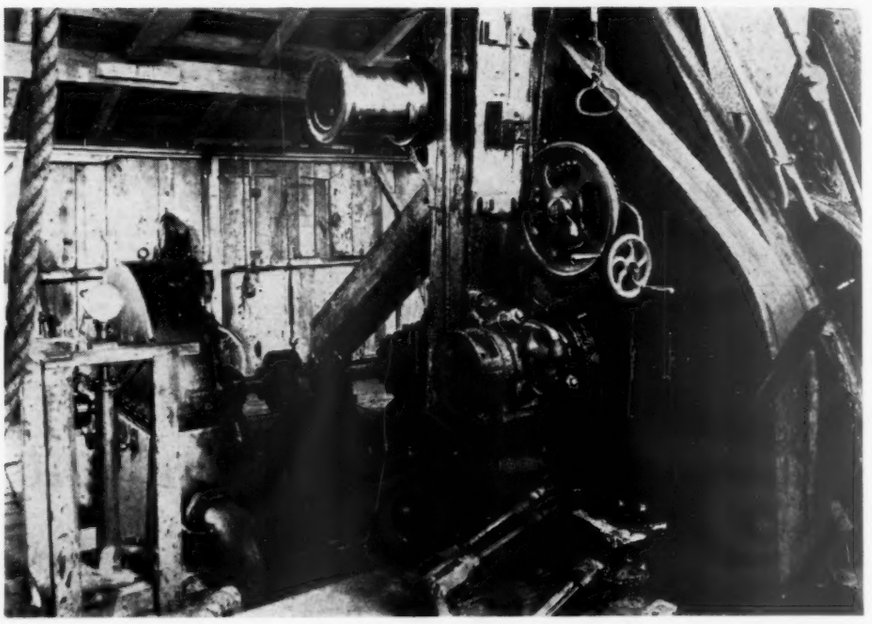
One of the most important subjects engaging the thought of engineers in Roumanian oil fields is the adaptation of internal combustion power to drilling operations. Diesel engines have regularly been used in the operation of percussion-slush rigs imported from Germany; and, when such equipment was supplanted by modern machinery of the rotary type, it was natural that many local operators should seek to retain these efficient prime movers in the new service. Some operators have designed special clutches and counter-shafts and rigged up gear-driven slush pumps; and, have gone on about their business, making no particular fuss about the adoption of Diesel power in rotary drilling.

The components of one such hybrid rig is impressive as representative of the different types of machinery and talent being co-ordinated in the development of the Roumanian oil industry. The draw works and rotary are probably veterans of Captain Lucey's first invasion of Roumania. The gear-driven slush pumps were made by Anton Raky of Germany. Although these units were still in good working condition, first glance gave the impression of obsolescence; and, it is not until one notices a Drillometer weight indicator and a Foxboro recorder and hears the exhaust of an internal combustion engine that one is prompted to investigate further. Going back into the engine house, one finds the draw works driven by a two-cylinder 180-h.p. Junkers Diesel engine, operating through a counter-shaft and reverse clutch of German-Roumanian origin. The pumps were driven by a smaller two-cylinder Junkers engine of only 70 h.p.

The accompanying drawing shows an alternative Diesel engine hook-up, both engines being connected to the same countershaft, thus making it possible to apply their total power either to the pumps or the draw works.

Use Hydraulic Drive

Of greater interest to the talent, however, is the transmission of energy from the prime mover to the draw works



Front view of draw works, showing hook-up of 100-horse-power Pelton wheel

and pumps by means of water pressure, as practiced by the Astra-Romana Company, a Shell subsidiary. The hydraulic drive was invented by G. P. Lehmann, a German member of the company's engineering staff. An experimental unit manufactured by Alfred Wirth, of Erkelenz, Rhineland, has been used in connection with an Emsco three-speed draw works and a 6¾"x14" O. W. S. pump in the drilling of five wells ranging from 2200 to 3500 feet in depth. Power was derived from a bi-cellular centrifugal pump operating at 1450 r. p. m. driven by a 160-h.p. electric motor and forcing water against a 100-h.p. Pelton wheel. This rig functioned satisfactorily in routine drilling operations, but was somewhat sluggish in hoisting drill pipe from depths below 1500 feet.

This inadequate hoisting power is regarded merely as one of the "bugs" which must be ironed out of any new invention; and, specifications are being drawn for the manufacture of a larger and more powerful unit, the capacity of which is expected to equal or exceed that of the heavier type of steam-driven rigs in every particular. The new unit will consist of two 200-h.p. electric motors, two centrifugal pumps of suitable capacity, one 240- or 280-h.p. Pelton wheel for the operation of the draw-works, and a second 150-h.p. turbine for driving the slush pumps. Both centrifugal pumps will be interconnected to both Pelton wheels, so that the full power capacity may be applied either to the draw works or to the slush pumps or both. Normally, the second motor will be used only while hoisting drill pipe, as one pump will supply ample power for the operation of draw-works, rotary, and pumps during routine drilling. The larger Pelton wheel will have two ports or water-inlets, each capable of delivering 120 horse-power to the draw works. One of these will be closed in ordinary drilling, as two water streams will be necessary only while hoisting pipe.

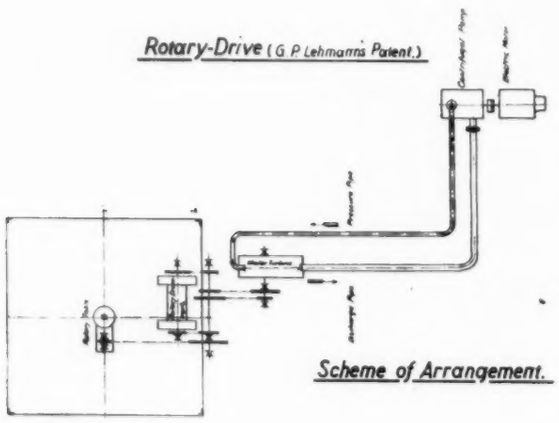
These water-inlets are controlled by valves or throttles, which give to the turbine all of that flexibility which is the chief virtue of steam engines. As a matter of fact, there are three such ports, since another is used for reversing the wheel. It will be noted from the accompanying photograph showing the wheel dismantled that its vanes are two-sided, so that it may derive power from either direction of the water flow, forward or reverse. The turbine is reversible by the operation of a single control, which opens one port and closes another. It is claimed that the reversal manoeuver, from full-speed forward to full-speed reverse, requires only 10 seconds for completion. The counter-current of the Pelton wheel is also employed in braking, making it unnecessary to use the usual drum brake. In addition to the valves which admit and reverse the flow of water through the turbine, there is another adjusting valve which controls the volume of water striking the Pelton wheel, by means of which infinite adjustment and regulation of speed and power is secured.

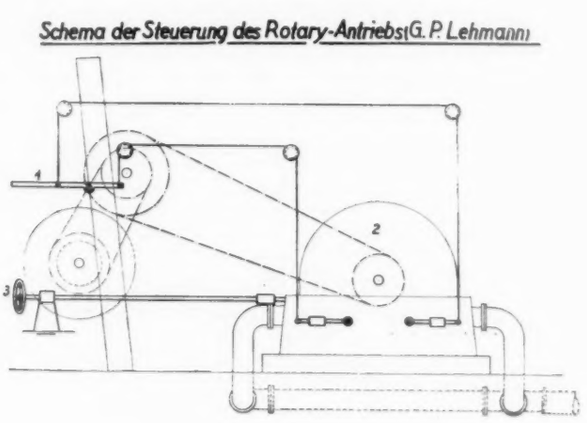
Advantages of Turbine Drive

The advantages claimed for the turbine drive may be enumerated and described as follows[1]:

Internal-combustion Power. The turbine drive is adapta-

[1]The accompanying photographs and drawings refer to the small experimental unit as designed for the larger one have not yet been completed.



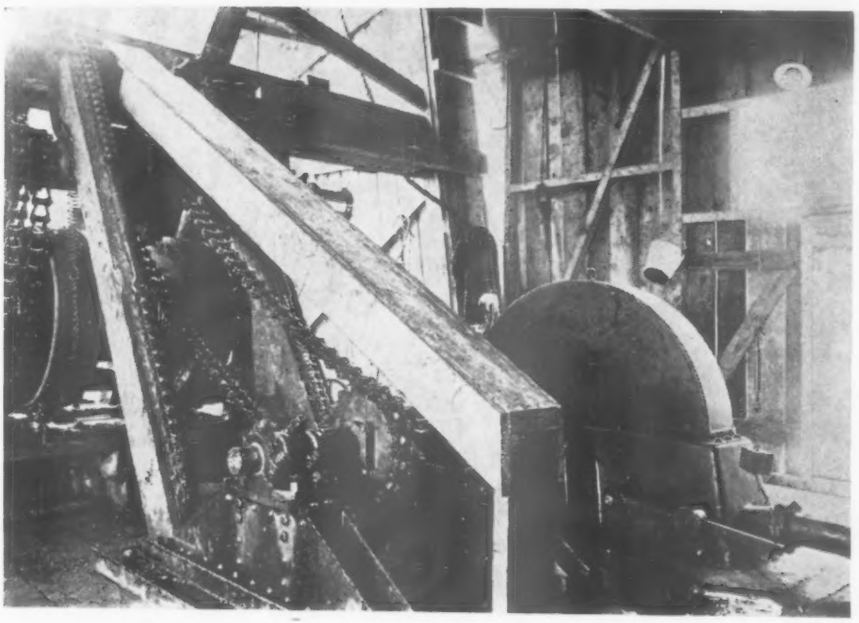


Mobeni's Burning Well at Night

This Insert

Shows the famous burning well No. 160 of the Romana-Americana, subsidiary of the Standard Oil Company of New Jersey, at Moreni, Roumania. The well caught fire May 28, 1929 and has resisted all efforts at putting it out. The well was taken over by the Roumanian Government shortly after it took fire and all work since that time has been under the direction of the government.

—Photograph through courtesy of Engineer G. P. Lehman, of the Astra Company.



Rear view of draw works, showing hook-up of 100-horsepower Pelton wheel

ble to any form of power; but, obviously, it will have a particular adaptability for electricity and internal combustion engines, and will be of greatest service in drilling at locations remote from water and fuel supplies. Electricity has been used in the preliminary experiments simply because it was the form of power most readily available. When Diesel engines are used, it will be necessary to use gears to develop 1450 r. p. m. at the centrifugal pumps.

Water economy. Water for the operation of the turbines may be used over and over again indefinitely, requiring the addition of only about six or seven barrels per day to replace losses by evaporation and leakage. About 63 barrels of water are needed as a power medium. The small quantity of water required permits the addition of glycerine or other anti-freezing compounds, as required during the extreme cold of Roumanian winters. Heat generated by pressure and friction keeps the water from freezing while the rig is in operation.

Operating economy. The only wearing parts are nozzles at the water inlets, as the water transmission has none of the weaknesses developed by clutches and gears when subjected to heavy strain. It is claimed that repair and maintenance costs are much lower than in the case of mechanical clutches and direct drives, as the resilient fluid absorbs the pulsations of the internal combustion engines and protects the prime movers themselves from shocks transmitted through the drill pipe from the bit. Thus, the Pelton wheel acts as a shock-absorber protecting both the engines and the draw works, each from the shocks and vibrations of the other.

Fuel Economy. Preliminary tests indicate that the Lehmann drive requires more electric energy than the Hild drive, for example and comparison; but its best showing will be made when using internal combustion engines in comparison with steam power. A Diesel-powered job, for example, will include two six-cylinder 200-h.p. motors, which will require only about 13½ per cent of the fuel oil needed to operate a four-boiler steam rig of equal power and capacity; and savings will be commensurate in the case of gas engines and gas-fired boilers.

Economy of Weight and Transportation. Electrically-powered turbine-drive rigs will possess a far greater degree of portability than steam-driven units. In the case of Diesel-driven rigs, the heaviest unit of the assembly, i.e., a six-cylinder 200-h.p. Diesel motor with flywheel and foundation plate removed for transportation, will weigh only about 12,000 pounds, or about 55 per cent of the weight of one 80-h.p. oil field boiler. The total weight of the the Diesel-turbine assembly will be about 60,000 pounds less than that of a four-boiler steam rig.

First Cost. It is estimated that the first cost of a Diesel turbine outfit will exceed the total cost of a comparable steam rig by $10,000 to $15,000. The two 200-h.p. Diesel motors will cost about $5,200 each f. o. b. Roumania points; and the hydraulic transmission, including two Pelton wheels complete with piping, fittings, and valves, will cost from $13,000 to $15,000. The two centrifugal pumps, probably will not add materially to the cost of the outfit, over the cost of a modern twin-cylinder steam engine which they would replace.

Operating Advantages. The turbine drive is even more flexible than the steam drive, as the prime movers and centrifugal pumps operate at constant speeds entirely independent of the speed of the draw works and pumps. Highest mechanical efficiency can thus be achieved in the operation of engines or motors running at constant speed. The Pelton wheel never sticks "on center," as does a steam engine. Even if all the ports are closed, no harm results to the centrifugal pumps. The turbine drive exerts its highest torque at starting speed, and affords complete control of torque at all times.

Pelton wheel dismantled

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Possessing as they do the characteristics of strength, ductility and accuracy of workmanship, their use not only insures safe and successful operations, but also that long service so much desired.

The increasing demand for British Mannesmann Casing, Drill Pipe, etc., furnishes unquestionable proof that their exceptional qualities are recognized and appreciated by discriminating users.

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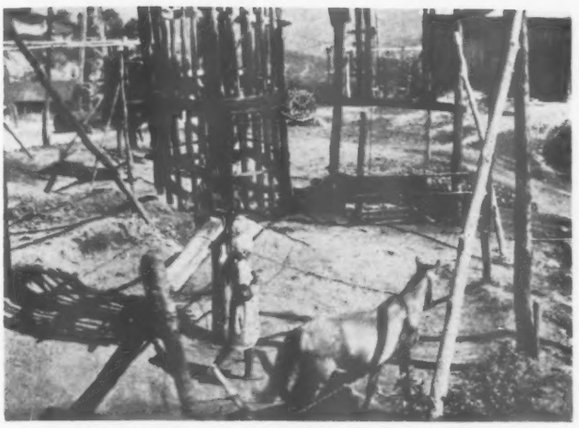
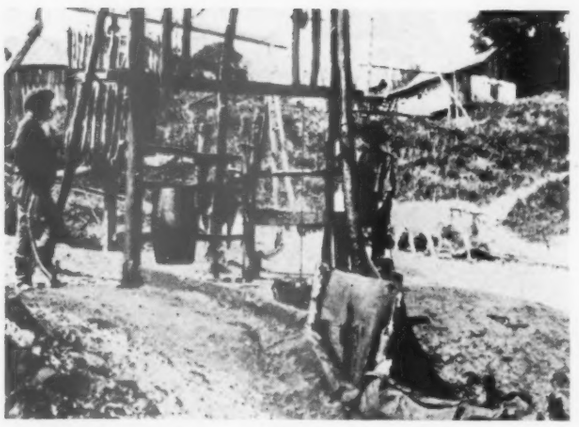


A "one-horse" operation. Bailing oil from a typical hand-dug well in Roumania. Women and children serve as pumpers



Bailer used in obtaining production from hand-dug wells in Roumania

Oil Is Still Produced *By Manual Methods* In Roumania

THE exploitation of petroleum in Roumania dates from early in the sixteenth century. Detailed production records are available since the year 1640; and thus the Roumanian oil industry antedates the American by more than two centuries.

Manual methods of drilling and production were in general use until 1860; and, in fact, have never been abandoned by some operators.

However, it is not purposed to deride the few Roumanian "die hards" who still cling tenaciously to the primitive methods of their great grandfathers, many times removed. Rather, perhaps, we should take off our hat to them, it is to be noted that they are still doing business at the same old stand while the owners of more up-to-date equipment are suspending operations all over the world on account of hard times and low crude values.

To visit the Bustenari field is like turning back the calendar of time. There, one sees oil produced by methods identical to those which are employed during the lifetime of those first venturesome colonists who founded Jamestown, five generations before the Declaration of Independence, as if mechanical power had never been invented.

These hand-dug wells have a diameter of about one meter, and range in depth from around 200 feet to more than 800 feet. They are curbed or cased with wooden slabs. The joints are fitted with remarkable precision.

Showing methods by which hand-dug wells of Roumania are lined or "cased"

Such wells are dug by devout workmen whose invariable custom it is to make the sign of the cross before entering the pits to commerce each tour of duty; and well may they cross themselves, for many of them never come out again. Theirs is a hazardous occupation, in which one may meet death from any number of different causes, including asphyxiation, drowning, burial under heaving sands, and injury by falling rocks, buckets, and other objects.

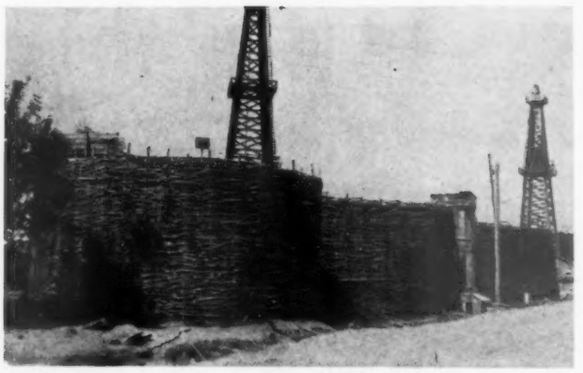
As the excavators enter the gaseous zones, fresh air is supplied through pipes or hose by means of bellows operated at the surface. It is said of these workmen, as also of native workmen employing similar methods in the production of oil in Assam and Burma, that they are willing to entrust the operation of these bellows, upon which their very lives depend, only to their very near and trusted relatives, preferably to persons who would suffer economic loss as a result of their death.

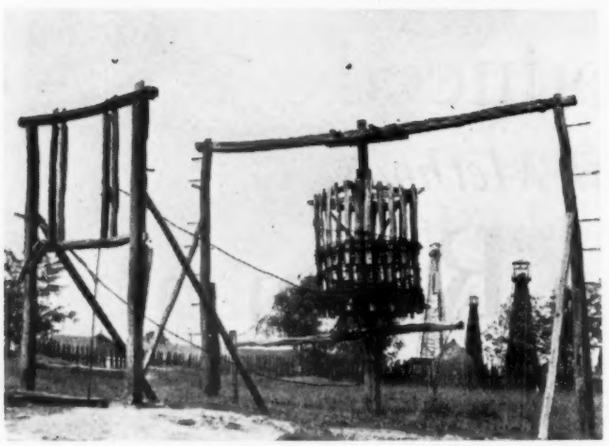
Light is supplied at the bottom of these pits by means of mirrors rigged up to deflect the sun's rays from the surface.

Roumanian native well-diggers seek to protect themselves from drowning or asphyxiation by sudden inrushes of oil, water, or gas by driving test holes of small diameter

Right: Old-style wooden tanks still exist in the Moreni field, Roumania. The woven enclosure covers an insulating jacket of clay 12 inches thick

Below: Roof of wooden tank in Bustenari field of Roumania, showing insulating jacket of clay held in place by woven withes to conserve heat in the handling of paraffinous crude



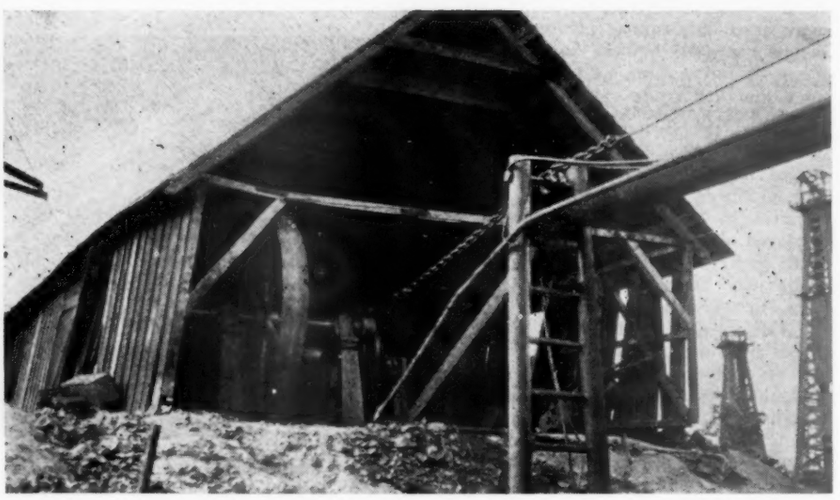


Home-made drum on which bailing lines are operated, Roumania

Right: Manually-operated hoisting equipment in the Bustenari field of Roumania

Above: Method of pumping wells in Roumania

Right: Band-wheel operating pumping equipment shown in picture on the left, Runcu field, Roumania



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CARRIED THROUGHOUT ALL OF THE OIL FIELDS

ahead of their digging. If oil flows are found, they await their exhaustion before proceeding with the excavation of the full-diameter hole.

Helmets are worn to protect them against falling objects, which attain very great velocities in drops ranging from 200 to 800 feet.

Cuttings are removed in buckets operated by cables and windlasses; and production is recovered in a similar manner. In olden days, it is said, cow hides were used as bailers.

The method generally employed for the lifting of production consists of dual buckets or bailers, one attached to each end of a cable wound around a vertical drum or "hacna." These drums are operated by horses walking around and around, as in pulling an old-style haypress. As one bucket is raised, the other is lowered, the descending bucket partially counter-balancing the weight of the ascending one.

The horses are generally attended by women and children. Sometimes one "pumper" serves two or more wells, alternating his attention from one to the other and allowing the horse on one well to rest while the animal on the other is working.

Other operators in the Bustenari field use methods slightly more advanced in that they use mechanical power for pumping while still using manual power for hoisting tubing and rods. An illustration shows a crew of roustabouts running a string of rods by means of a manually-operated hoist. Note that an eye-bolt is used in lieu of rod elevators, this piece being laboriously screwed on and unscrewed from each rod handled.

Power is supplied to such wells from old-style push-and-pull powers. Strange to relate, this self-same power is driven by an electric motor. Other wells derive power from vertical band wheels and cranks. Walking beams are not used; instead, the up stroke is derived from counter weights.

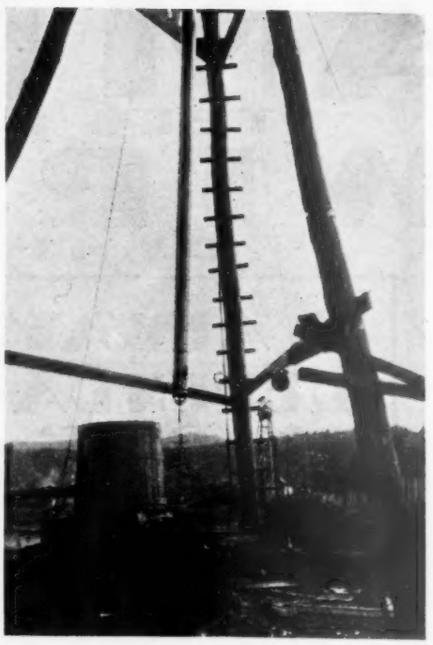
Production By Bailing

Another feature of old-style operations in Roumania is illustrated at Campina, where shallow wells are operated by bailing. Groups of these wells are operated by remote control, receiving their power through bailing lines radiating horizontally from centrally located Canadian rigs.

Open flow-tank used in Campina field, Roumania

Right: The bailer is dumped in a barrel placed near the mouth of the well; bailing for production in the Campina field, Roumania

Below: bailing lines radiate from a central hoisting rig in the Campina field of Roumania



Flags are placed on the bailing lines to indicate to the operator of the Canadian rig just when the bailers are nearing bottom and approaching the top of the wells; and, by manipulation of a battery of hoisting levers, he is able to control several wells at the same time.

Bailers are dumped by remote control by means of an ingenious arrangement. Small wires extend to the Canadian rig where the operator is stationed; and, by pulling on this wire, he can pull the bailer over above the dumping barrel. Then, when the operator releases the wire line, it is pulled back into a free position by means of a counterweight, whereupon the bailer, being raised up out of the dumping barrel, swings back over the mouth of the well.

Flexible Bailers

I have heard many tall tales in this oil business. In fact, I thought I had an unbeatable crooked-hole story when I found jointed flexible bailers which are used to bail corkscrew holes in Germany; but imagine my surprise when we arrived in Roumania and found them using sections of rubber hose for bailing wells so very crooked that bailers made of metal could not be inserted.

Bailing Forbidden By Law

Bailing is recognized in Roumania as uneconomic and wasteful; and, as such, is forbidden by law. However, the industry cannot completely be revolutionized in short order; and, meanwhile, special permits authorizing the continuance of bailing operations are easily procurable.

Nearly all new wells are being equipped for operation by gas lift or deep-well pumping methods.

Flow Tanks Insulated With Clay

Certain of the Roumanian crudes are highly paraffin, containing as much as 7 to 8 per cent of wax. Such oils become very difficult to handle in winter. Indeed, they must be heated before they can be pumped at all; and the conservation of heat thus becomes one of the major problems of the country.

This is done in some cases by applying a jacket or clay or surface soil. This clay is held in place by jackets of woven withes built around the tanks at a distance of about two feet from their walls.

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The Institution of Petroleum Technologists

THE Institution of Petroleum Technologists is the most influential petroleum engineering body in the world, outside the United States. While domiciled in London and serving principally petroleum engineers located in Europe and other fields remote from the United States, the Institution is international in scope and includes in its membership engineers of American as well as British and other nationalities. Its activities and its influence encircle the globe. A check of its roster reveals that it has active members and associates in England, Scotland, Ireland and Wales; in 14 different countries on the continent of Europe; in 11 American states; in 18 different British dominions, colonies, and protectorates; in six South American and three Central American republics; in four Dutch colonies; and in Persia and Japan, in the Near and Far East. Indeed, a check of its membership list is like a roll call of the oil producing regions of the world.

Owing to the growth of the Institution and the increase of interest in petroleum technology, branches have been founded

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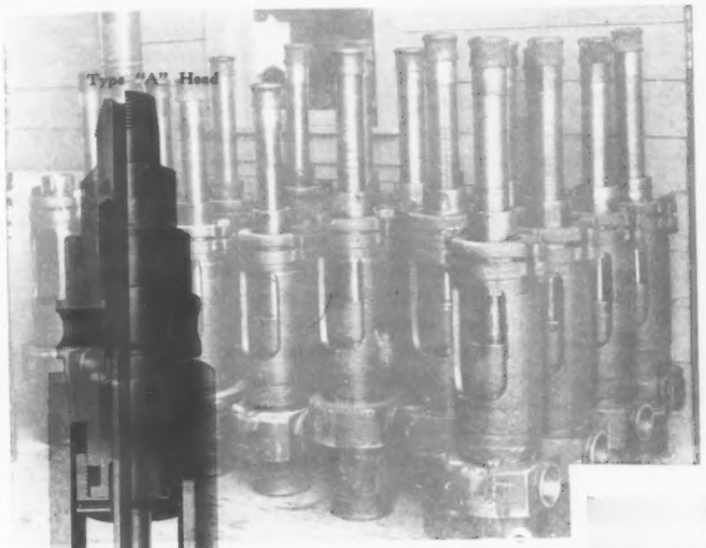


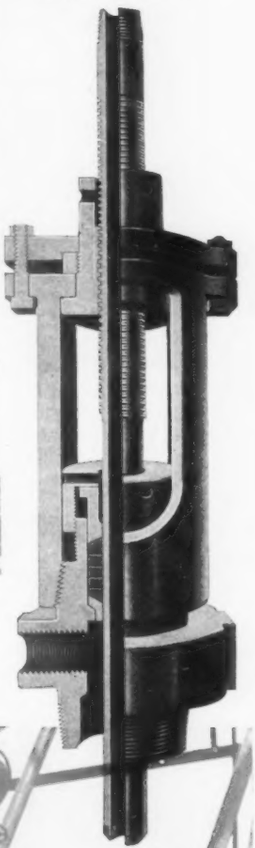
Type "A" Head

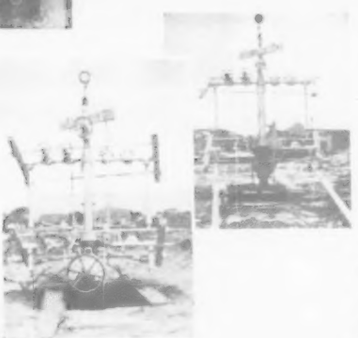
30-DAY WAREHOUSE STOCK FOR THE VAN FIELD

Many companies insure the future by keeping on hand a sufficient number of Brown Safety Tubing Heads to meet all requirements. Under this plan there are no costly waiting periods and no temptation to go ahead without the proper protection.

To the Right is a cut of Type "B" Brown Safety Pressure Head.

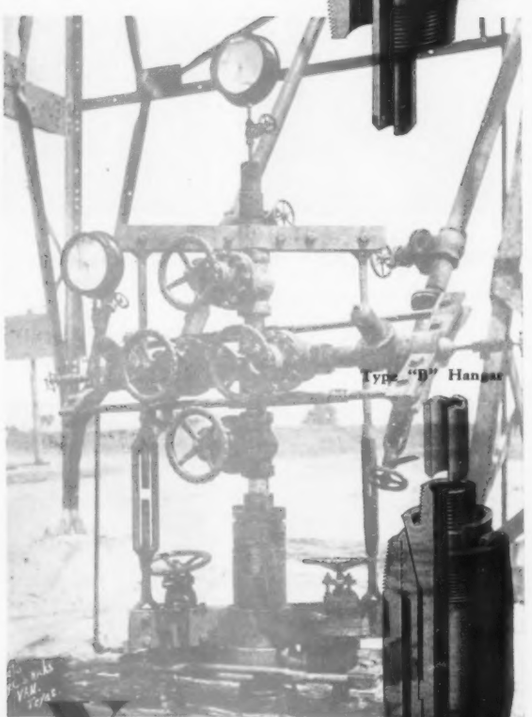
Type "B" Head



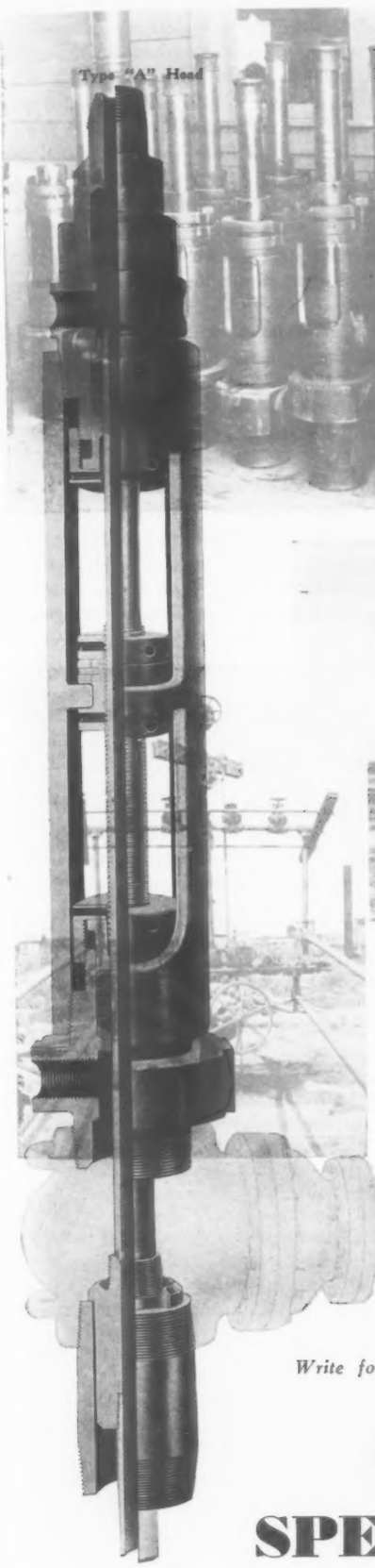


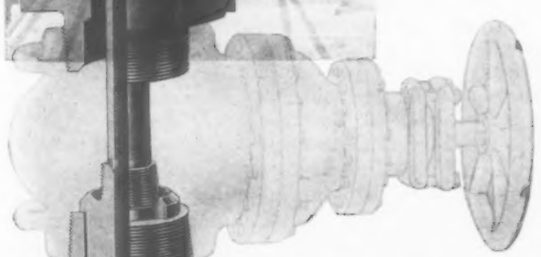
The above represents a row of installation of Brown Safety Pressure Heads in the high pressure Refugio Field.

To the right is an installation of one of the Brown Safety Pressure Heads in the Van Field.



Type "B" Hanger





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in Roumania, Trinidad, and South Wales, where members meet regularly for purposes of fellowship and the discussion of problems arising from their professional work.

A. Frank Dabell, field manager for British Controlled Oilfields, Ltd., is chairman of the Trinidad branch. W. C. Mitchell, manager of National Oil Refineries, Ltd., heads the Welsh branch; and Captain J. E. Treacy, prominent supply dealer of Ploesti, is honorary secretary and treasurer of the Roumanian branch.

The Institution also has a students' section, founded in 1923. L. P. Timmins, of Birmingham, heads the Birmingham branch of the students' section.

Its activities are in part social, as well as technical, as its headquarters at Aldine House, in the Strand, serve as a meeting place for oil men coming to London from all quarters of the globe. One may go there at almost any time and meet engineers from the United States, South America, Continental Europe, and the East. Or, if one seeks news of any engineer engaged in foreign operations anywhere, it will very probably be forthcoming from Commander R. E. Stokes Rees, the secretary or Miss Clara Despard, the librarian.

The Institution maintains a technical library second to none. All American, British, and foreign trade journals are available in its reading rooms; and technical books, papers, pamphlets, and geological surveys from all over the world are carefully indexed and readily available to any member who may require them.

One of the most important features of the Institution's activities is delegated to its standardization committee, organzied in 1921, which is charged with the standardization of methods of testing petroleum and its derivatives, in conjunction with other official bodies. Its first report, published in 1924, and a revised edition published in 1929, constitute reference works the authoritative nature of which goes unchallenged in the petroleum industry.

Supports Two Scholarships

The Institution supports two scholarships, one at Birmingham University and another at the Royal School of Mines, London, by means of which fourth year students of petroleum technology are assisted with their studies. An annual fellowship for research work in petroleum technology was founded in 1929.

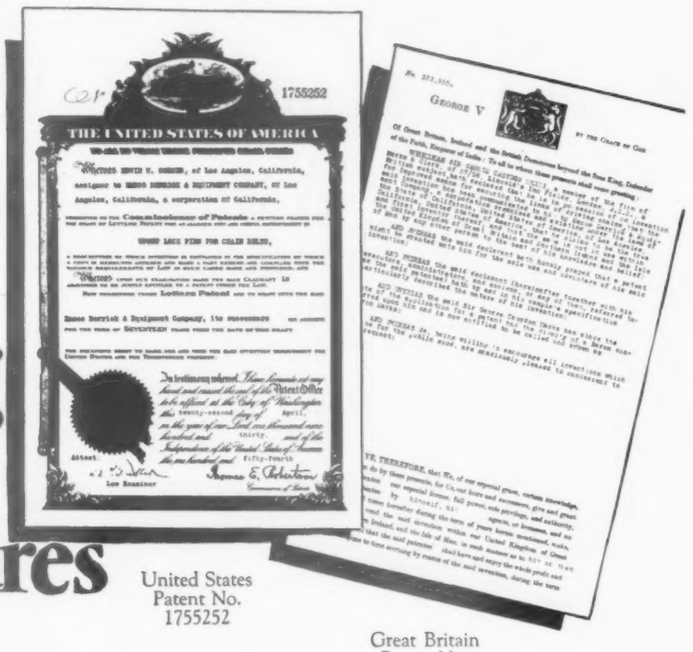
General meetings are held at monthly intervals from October to May, of each year, on which occasions papers dealing with various problems of the industry are read and discussed by the members. These papers, which are afterward published in the *Journal* of the Institution, represent contributions to the technology of petroleum, the importance of which is recognized all over the world. Abstracts of the important technical literature of the world, in so far as it relates to petroleum, are also published regularly in the *Journal*.

The Boverton Redwood Medal, instituted in commemoration of the founder of the Institution, is awarded for the best paper or series of papers published in the *Journal* during two consecutive sessions.

The Institution was founded in 1913 and incorporated in 1914, under the leadership of the late Sir Boverton Redwood and Arthur W. Eastlake, of London.

Dr. A. E. Dunstan, chief chemist for Anglo-Persian Oil Company, Ltd., of London, is now serving his second term as president of the Institution, while past presidents include such outstanding personalities as Sir Boverton Redwood and Sir Frederick W. Black, deceased, the Rt. Hon. Lord Greenway of Stanbridge Earls, Sir John Cadman, Sir Thomas Holland, Professor John Samuel Stratford Brame, Herbert Barringer, and Alfred C. Adams.

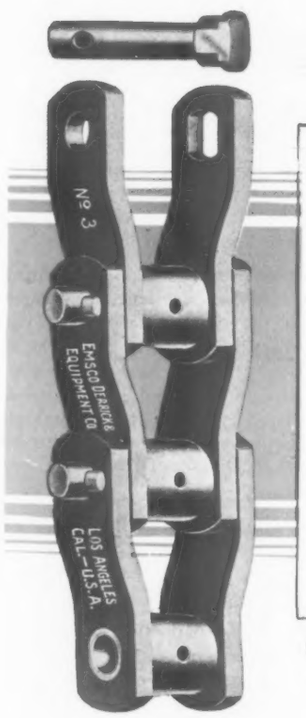
PATENTS GRANTED on Solid Locking Pin--*and other* Superior Features *found only in*

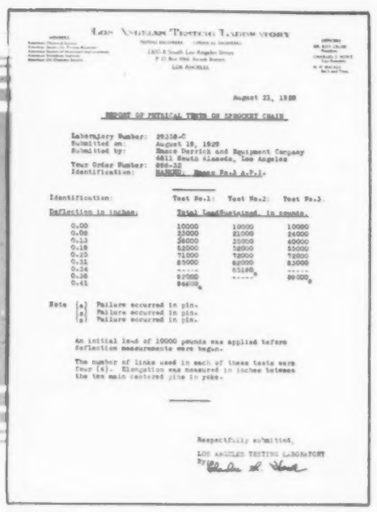


United States Patent No. 1755252

Great Britain Patent No. 323955

EMSCO *Chrome Vanadium Steel Sprocket* CHAIN





August 23, 1929

REPORT OF PHYSICAL TESTS ON SPROCKET CHAIN

Laboratory Number: 29158-C
Submitted on: August 19, 1929
Submitted by: Emsco Derrick and Equipment Company
6811 South Alameda, Los Angeles
Your Order Number: 868-32
Identification: Emsco Steel Sprockets

Identification:	Test No.1:	Test No.2:	Test No.3.
Deflection in inches:	Total Load Sustained in pounds.		
0.00	10000	10000	10000
0.08	35000	35000	34000
0.13	58000	55000	60000
0.18	62000	58000	65000
0.25	71000	72000	72000
0.31	85000	82000	83000
0.34	-----	85240	-----
0.36	87000	-----	86000
0.41	86800		

Note (a) Failure occurred in pin.
(b) Failure occurred in pin.
(c) Failure occurred in pin.

An initial load of 10000 pounds was applied before deflection measurements were begun.

The number of links used in each of these tests were four (4). Elongation was measured in inches between the ten main centered pins in pairs.

Respectfully submitted,
LOS ANGELES TESTING LABORATORY

The Emsco patented solid locking pin has been acclaimed by operators everywhere as a big step forward in prevention of chain breakage and accidents. The old split cotter pin method not only caused torn hands and clothing, but had the added disadvantage of permitting chain pins to come loose. Emsco Solid Locking Pins *cannot work loose.*

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Polish Operators Join Forces For Wildcat Prospecting

POLISH oil producers find themselves in a very critical situation—in danger of being crushed between the upper mill-tone of imported Russian petroleum and the nether mill-stone of declining domestic production. The Soviets and Roumanians are close at hand, ready and alert to take over the Polish market if and when domestic producers are no longer able to supply it. This state of affairs has brought about a notable revival of activity in the Carpathian regions and bids fair also to revolutionize drilling and production practices. Statistics prepared by the Panstwowy Instytut Geologiczny and reproduced herewith from Statystyka Naftowa, of Warsaw, show a decline of 6749 "tanks," or about 506,175 barrels, during 1929, with a further loss of more than 1,000,000 barrels per annum since 1925. This decline is all the more serious in the face of increasing consumption, increased drilling activity, and improvements in methods and machinery which have resulted in the shortening of average drilling time.

Polish producers are alive to the seriousness of their situation and are embarking upon a comprehensive campaign of modernization, geological research, and exploratory drilling. Recent reports show a smore or more of wildcat operations in progress at as many strategic locations in proximity to proven fields; but the most encouraging sign of progress is found in the co-operation of major producers with the Polish government in the organization and financial support of a joint enterprise for geological and geophysical reconnaissance, prospect drilling, and the study, adaptation, and introduction of modern operating methods. The whole subject of petroleum has been laid open for investigation along co-operative lines and by methods similar to those which have contributed in large measure to the advancement of the petroleum industry of the United States.

This vast program has been entrusted to an organization appropriately named "Pionier," Spolka Akcyjna dla Pozukiwania i Wydlobiwania Mineralow Bitumicznych, we Lwowie, ("Pioneer" Company for Prospecting and Exploitation of Bituminous Minerals, of Lwow), which is supported by the Polish government (10 per cent), and the Malopolska, Limanowa, Galicja, Standard Nobel, and other smaller companies. It is financed from these sources to the extent of 15,000,000 zloty ($1,691,093), plus 5,000,000 zloty ($563,697) subscribed by the Petroleum Syndicate (marketing cartel) for the special purpose of geological research.

The management of the prospecting company is entrusted to Dr. S. Weigner, a leader of the European geological profession, as managing director, and John W. Klimkiewicz, formerly of Humble Oil & Refining Company in Texas, as technical director. Competent engineers and operating personnel have been employed, comprehensive geological and geophysial surveys are in progress, and active drilling operations have been commenced with a program of four test wells in 1930 and fifteen in 1931.

In addition to its own activities, the pioneer society contributes technical and financial aid ("dry-hole money") to other companies engaged upon prospect drilling at approved locations. The government also fosters wildcat activity by the remission of income taxes from production derived from new fields discovered in pioneering work.

Limanowa Company's wildcat well No. 62, by which it is hoped to extend Mraznica field in a southwesterly direction

Three Wildcats Drilling

The "Pioneer" company is engaged in drilling three wildcat wells at present, one of which is located about one mile south of the Mraznica field, in the direction toward which the productive sands are believed to extend.

The organization of the Pioneer Society along technical and commercial lines will afford an excellent opportunity for the adoption of the unit plan of operation in event its efforts result in the discovery of new oil-bearing lands. However, the plans of the society and its backers have not been projected so far into the future; and it remains to be decided whether new fields, if found, will be developed jointly, subdivided among the several parties at interest, or sold to contributors or other bidders.

The equipment which is being used by "Pioneer" is of the very latest design, according to Carpathian practice, consisting of modern Polish-Canadian drilling rigs driven by electrical power.

The official program of the society includes the introduction and adaptation of geophysical prospecting methods to Carpathian conditions, the promotion of scientific research, and the study and adaptation of modern drilling and production methods, including re-pressuring, deep-well pumping, and so forth. The society's engineers are also investigating the feasibility of oil mining methods as practiced in France and Germany; and, if production cannot be increased by other means, Poland may also commence to mine for oil.

Galician Area Tested Only In Spots

GALICIAN oil fields occur in a belt about 30 miles wide, north and south, by 250 miles long, northwest by southeast, paralleling the Carpathian Mountains from Limanowa, near Krakow, to Bitkow, near Stanislawow. Drilling has heretofore been confined to the foot-hills in the vicinity of seepages and other visual evidences of petroleum, comparatively little prospecting having been done in the valleys and on the flanks of the mountains. Although important fields are rare, this long narrow belt is literally covered with shallow wells drilled by small "hay-wire" operators who cannot afford mechanical power and deep drilling.

Oil has been known in the Carpathian foot-hills since mediaeval times. For hundreds of years prior to the development of machinery for drilling wells of small diameter, oil was produced from pits and shafts sunk to penetrate oil-bearing formations near their outcrop on the flanks of the mountains. Some of these shafts reached a maximum depth of 850 feet. Such primitive methods were discontinued about 70 years ago, shortly after the invention of drilling machinery.

There is now, however, some talk of the resumption of mining activity in an effort to arrest the decline of production; and, with this in view, Polish engineers are giving attention to recent advances made in the methods employed in mining for oil at Pechelbronn, France, and Wietze, Germany. There would seem to be no insurmountable obstacle in the way of such a scheme, as oil-bearing formations are known to occur at shallow depths. In fact, ozokerite is already being mined in the Boryslaw district.

Having identified the province in the minds of those whose geography is of pre-war vintage, I shall dispense with the Germanic term "Galicia," which is not favored by the liberated Polish people. For the same reason, the city of Lemberg, which is the oil capitol of Poland, is known as Lwow.

The Boryslaw District, which includes the Boryslaw, Mraznica, and Tustanowice fields, is the most important in Poland, although one might also mention the Bitkow and Schodnica (Pereprost) fields. The former, which is situated near Stanislawow, is of interest since, after Boryslaw, it is the only other deep field in the country; and the latter, a shallow field, is of some importance since it produces about 750 barrels of oil per day. The Daszawa gas field, which is of comparatively recent discovery, produces gas at a pressure of about 850 pounds from depths ranging from 1465 to 2500 feet.

The Boryslaw field is practically depleted. Greatest activity is found in the Mraznica section nearby. This latter field has been extended about two miles during the last two years, and further extensions totalling about one mile are expected from wildcat wells now being drilled. Development is toward the south, with dips and depths increasing in that direction. Thus, the tendency is toward deeper drilling, which is one of the factors operating to bring about a modernization of Polish operating methods.

Production Fluctuates

Polish production fluctuates slightly above and below 13,000 barrels per day. Nearly three-fourths of this is in the hands of four major companies, "Malopolska," "Limanowa," "Standard-Nobel," and "Galicja." The remainder represents the output of numerous small independent operators, many of whom employ manual methods of the most primitive sort.

These independents and their peasant employees, many of whom live and work under conditions inconceivable to the American oil-field worker, bend their backs day after day in bailing their small shallow wells by hand-power. Depleted wells no longer capable of returning the cost of mechanical operation are subleased by the larger companies to these independents under share-basis arrangements somewhat similar to those in vogue in certain of the older fields of the United States.

About 70 per cent of the total production of the country is secured by swabbing about 15 per cent of the wells. Most of the remainder is produced by bailing, by mechanical and manual methods. There are, however, a number of shallow wells which are being operated by pumping methods. It has been estimated that the average production of the more prolific wells which are produced by swabbing is approximately 22 barrels per well per day, while the average output of wells produced by bailing and pumping methods approximates only 1¾ barrels per well per day.

Polish oil contains a high percentage of paraffin, which defeated the introduction of deep-well pumping methods several years ago. At that time, gas pressures had not been dissipated, and the expansion of cansinghead gas and consequent lowering of well temperatures caused the solidification and precipitation of pariffin to such an extent that production could be obtained only by swabbing and bailing. However, Polish engineers who have been studying the problem believe that, gas pressures having been ex-

Analysis of Boryslaw Crude

Specific Gravity .860 — 33° A.P.I.

Product	Asphalt Process	Coke Process
Gasoline	12 per cent	12 per cent
Kerosene	29.5 per cent	30 per cent
Gas Oil	24 per cent	25 per cent
Lube Oils	10 per cent	11 per cent
Paraffin	7.4 per cent	7.8 per cent
Asphalt	8 per cent	..
Coke	..	4 per cent
Loss and residuum	9.1 per cent	10.2 per cent

Meters Drilled in Poland During Year 1929

Drohobycz District—			
Boryslaw field	3,506		
Mraznica field	22,541		
Tustanowice field	8,050	34,097	
Shallow fields in vicinity of Boryslaw		18,103	
Total, Drohobycz District			52,200
Jaslo District			33,825
Stanislaw District			12,856
Total, all Poland			[a]98,881
Increase over year 1928			3.4%

[a]Equivalent to 324,412 feet.

(From **Statystyka Naftowa**, of Warsaw)

Gazolina Company's seven-inch gas line crossing the Dneister River, between Daszawa and Lwow, Poland

hausted, pumping methods might now be successful in the Boryslaw District; and at least one of the larger companies is planning to re-open this subject. Operators are coming to realize that paraffin conditions are no worse in Poland than in certain of the Roumanian fields, where deep-well pumping is supplanting bailing and swabbing methods, and, as the modernization of Roumanian operations continues, this influence is certain to be felt on the north flank of the Carpathians.

The engineering staff of the "Malopolska" company is designing an electrically-operated pumping unit which will have a stroke of 16 to 20 feet and which, it is believed, will be adaptable to the peculiar conditions of their territory. It will consist, essentially, of an automatic clutch by means of which a flexible cable will be wound onto and off of a hoisting drum to impart a stroke of whatever length may prove to be most effective.

Polish operators manufacture their own equipment to a very large extent. The Societe "Malopolska" maintans two factories for the manufacture of drilling tools and production equipment. The idea of the vertical trust prevails to much greater extent in Poland than elsewhere, it being considered within the scope of every well integrated oil company to manufacture all of the machinery used in its production operations.

This policy is held accountable in large measure for Poland's tardy progress in production methods. Producers, regarding foreign equipment manufacturers as their competitors, as, in fact, they are to the extent to which Polish operators manufacture their own equipment, have been generally reluctant to accept new equipment and revolutionary ideas which have been advanced in such profusion during recent years. Having provided themselves with forms, molds, and patterns for the manufacture of old-style equipment, and the output of their factories being limited, practically, to their own requirements, they have felt that they cannot afford to conform to changes in design which occur with such rapidity in other countries.

Apart from compressors and gasoline extraction equipment and a minimum of cable tools, one sees very little of American machinery in Polish oil fields. Percussion drilling tools, boilers, and steam engines are of Polish and Austrian manufacture. Tubular goods are from Prague and other European mills. Electrical equipment is predominently of German and Swedish origin. Most of the gas engines come from Germany, but American manufacturers seem to be getting a little better than an even break with a Warsaw firm in supplying gas compressors.

Gasoline Extraction

German manufacturers have formerly had the inside track in supplying gasoline extraction equipment; but nowadays one finds a few new plants equipped with compressors and other units of American manufacture. Most of the Polish plants are of the charcoal type, constructed of European equipment and operated by Polish and French talent. However, the newer plants are generally of the oil-absorption type, employing American-made equipment. The Societe "Gazolina," of Lwow, is using American equipment to construct a Newton process plant which will be completed during the current year.

Polish gas is very rich in gasoline, its content running from 11 to 17 gallons per 1000 cubic feet. While crude oil production declined, the production of natural gasoline increased from 31,854,940 kilograms during 1928 to 34,504,476 kilograms during 1929.

The French influence is very strong in the Polish oil industry, as 18 different Polish companies have been amalgamated into two groups known as the Societe Francais des Petroles de "Malopolska" and the Societe Francais des Petroles "Silva Plana," or "Limanowa," as it is known locally from the name of its principal operating subsidiary. These two groups control the bulk of the production, leaving the balance to the Standard-Nobel w Polsce, Polish subsidiary of the Standard Oil Company of New Jersey, and Galicja Galicyjskie Akcyjne T-wo Naft, a Polish organization. About 25 per cent of current production is in the hands of small operators, who are very strong numerically but very weak economically.

Surface expression of the sharp folding which characterizes formations in the Boryslaw field, Poland

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UNION Drill Cable at a well in the North Salem, Ohio, field, being drilled by the Capitol Drilling Company, contractors and producers, J. W. Blacksten, Pres. The men shown, left to right, are: W. N. Blacksten, general utility man of the Capitol; B. R. Hill and W. Shroyer, roustabouts; R. R. Nixon, driller; and W. L. Kelsey, manager of Jerecki store at Cambridge, Ohio.

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Formerly American Tank Company

Polish derricks are enclosed because of severe winter conditions

Polish Oil Industry Not Asleep

THIS is the second attempt to describe conditions obtaining in the Polish oil industry. The first contained the Rip van Winkle analogy, and was discarded as unfair to Polish engineers who are not asleep and who have made substantial progress along independent lines. However, the Rip van Winkle motif inevitably prevades one's initial impressions of Polish oil fields. In the first effort Rip's awakening was ascribed to the pangs of hunger and to the noise of rotary chains heard across the border in Roumania.

Hunger for additional crude supplies asserts itself because operations requiring up to two and four years to complete each well have been unable to keep pace with declining production and increasing consumption. Reports of the success of rotary equipment in Roumania have reverberated in Poland to disturb the complacency with which Polish producers have clung to methods and equipment developed by an earlier generation.

IN order to understand why it is that the modernization of the Polish oil industry has been so long deferred, one must give some consideration to European business policies and habits of thought. The following thoughts in this connection are based in part upon two chance remarks made by European engineers in the course of investigation of continental oil fields. One operator, as he lovingly caressed the polished and shining surface of a sturdy machine which was placed in service shortly after the turn of the century, warmly praised its performance record and remarked that it seemed good for many more years of service. Another explained that the chief reason for Polish tardiness in the adoption of methods which have become common practice in other countries is that the decline of production left the Carpathian operators with a surplus of serviceable machinery which, according to their tenets, had to be used and worn out before it could be discarded or replaced.

It should be made clear before continuing this discussion that it is not the intention to assume a critical role,—not even to accuse European operators of lack of progress. Any such tendency would be stifled by the realization that European industry is recovering from the devastating effects of war with far greater rapidity than might have been expected. Rather, is it necessary to picture and describe a situation for the understanding of New World readers.

These chance remarks, as straws in the wind, indicate the habits of thought of many in European oil fields. Use is made of comparison only to reveal the contrast with American ideas.

Obsolescense, the greatest crime in the American industrial calendar, is not so regarded in Europe. The average European cannot bring himself to scrap or discard serviceable machinery, not even after the invention of newer machines which could do the work more cheaply.

There is a case—not in Poland—where the operating executive of a small oil producing company decided against the purchase of certain production equipment which admittedly would have brought about a large increase in production and a lowered average of lifting costs on the ground that its purchase would deplete his treasury of funds ear-marked for an annual five per cent dividend! But here, again, it is not for the outsider to criticize the judgment of this official, as he doubtless had other factors to consider,—such, perhaps, as the alarm of stockholders at the postponement of their frugal annual dividend.

It is such habits of thought, together with other factors such as local and national pride and customs and language barriers which retard the progress of the oil industry in Europe. Suppose, for example, that American engineers, superintendents, and foremen had first to learn a foreign language in order to gain access to the literature of the oil industry!

Re-consider Rotary Equipment

The prediction is freely made among Polish engineers that modern rotary drilling equipment may come into general use in Poland during the next two years. Certain it is that the American method will be given another trial; and, if straight holes can be drilled in less tmie and at less cost for labor and casing, it is to be expected that Poland will follow the example of Roumania and other countries.

Rotary equipment was first tried in Poland about 1908; but the crude machinery of that day and time could not cope with the hard lime and sharp sand rocks found in what was then the Austrian province of Galicia. The Galacian fields were developed with Canadian pole-tools.

The main street of Mraznica, Polish oil town

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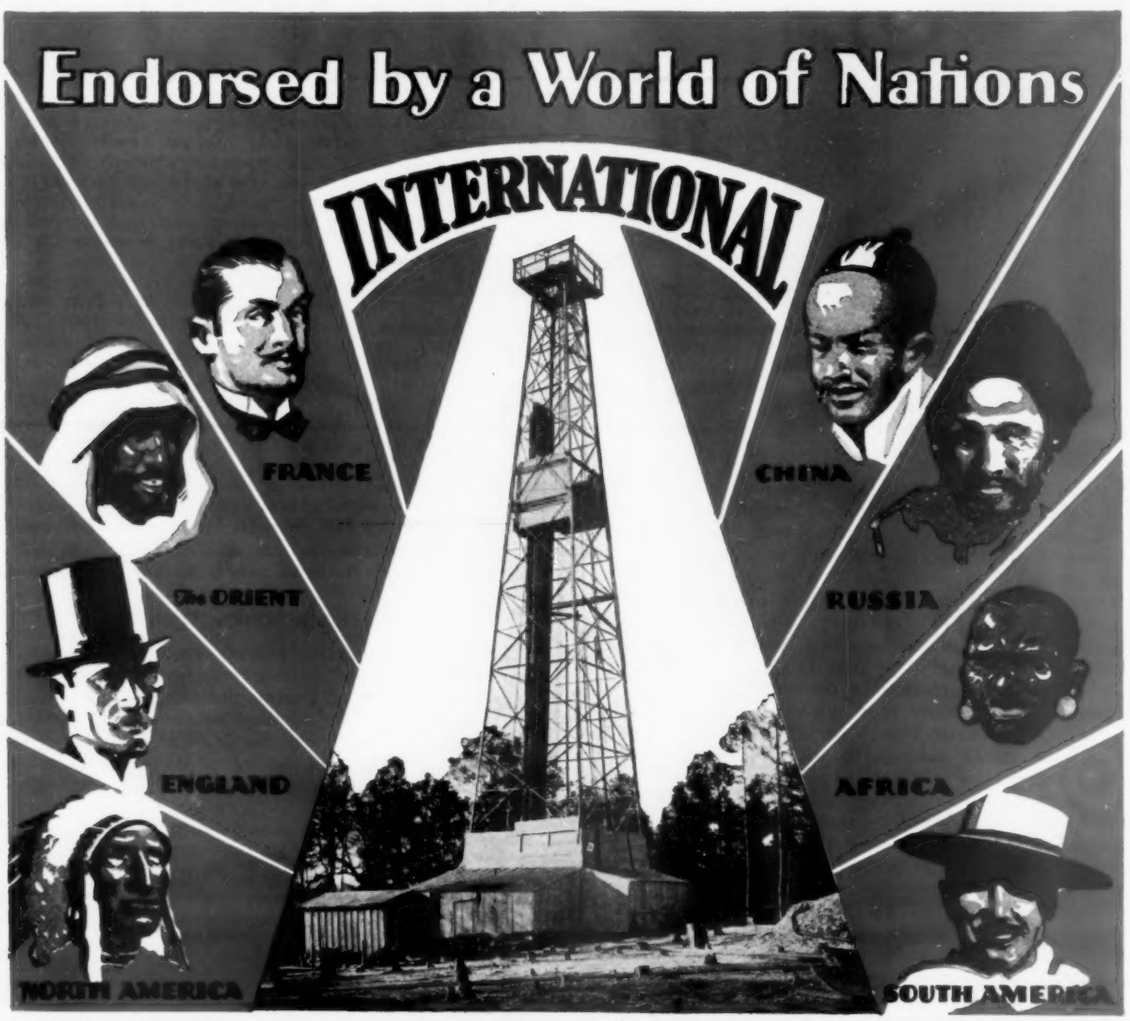

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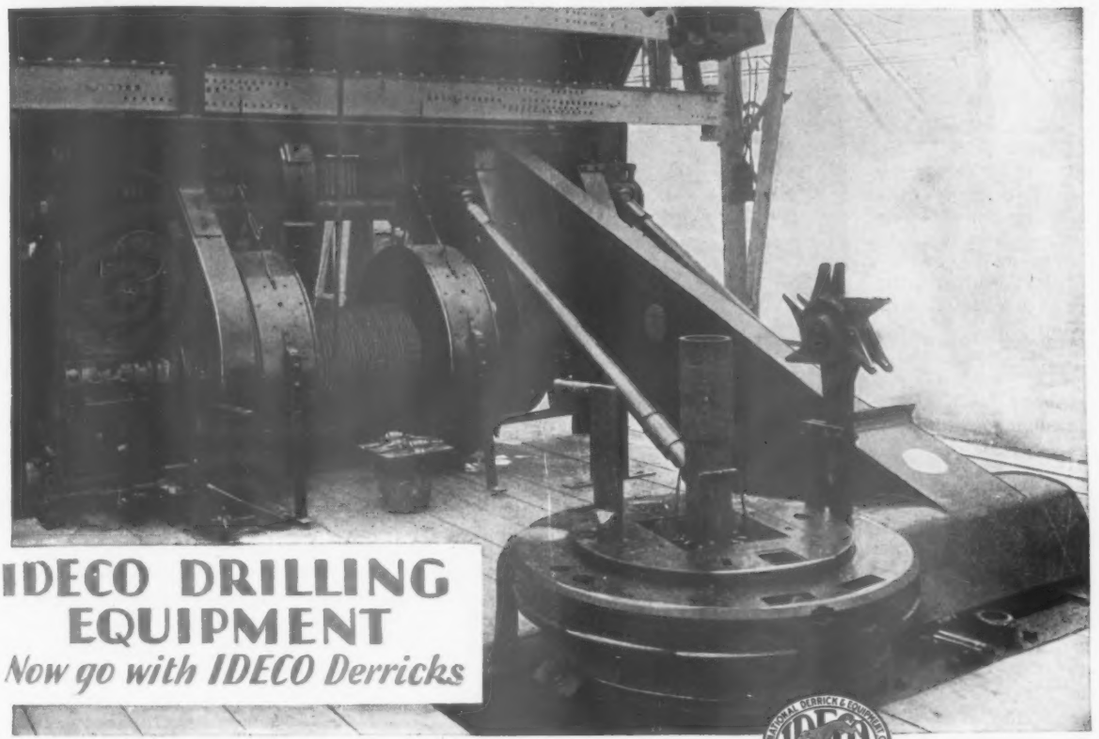

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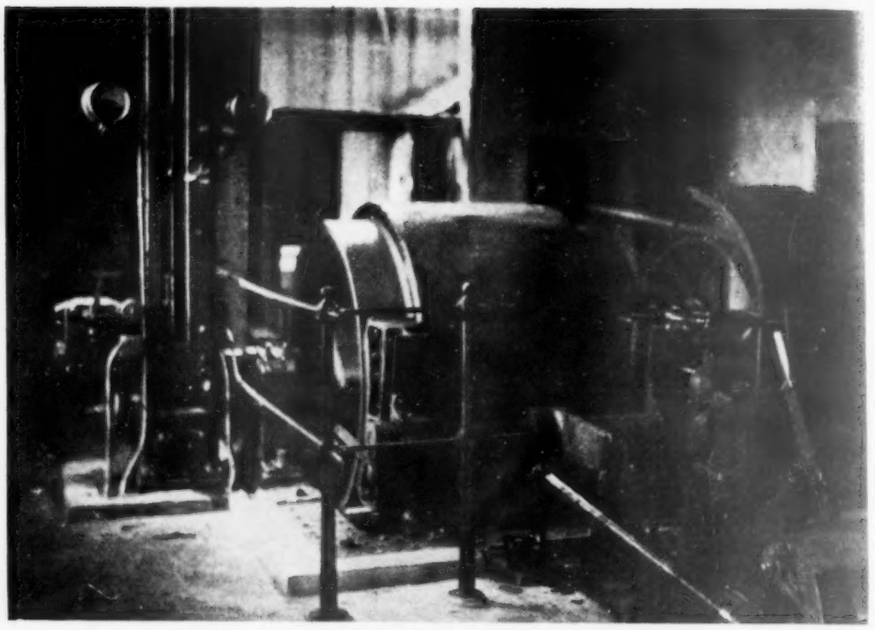


Electrically-operated hoisting drum or "bull wheel," Polish-Canadian drilling rig, Borysław, Poland

Pennsylvania cable tools were also used to some extent. Certain features were borrowed from each; and in the course of time Carpathian operators developed the Polish-Canadian or Austro-Galician system, in which are retained many of the mechanical features of the Canadian rig, the drill rods having been replaced by flexible cables. Unable or unwilling to pay the price of imported American underreamers, Polish operators developed the eccentric bit by means of which holes of large diameter are drilled below casing of smaller size. Nowadays, Canadian drill-rods are used only in certain types of fishing jobs.

The Polish-Canadian rig is a stupendous agglomeration of metal and timbers, made up of units so heavy and massive that it would seem to be capable of penetrating to the very bowels of the earth; but such is not the case, and it is its lack of capacity in depth that eventually must bring about its replacement by machinery of a more efficient type. By studying the bewildering mass of machinery, one is able to identify such units as the band-wheel, bull-wheels, and calf-wheel, with a surplus of other wheels and gadgets which have no place in the American cable tool rig.

Polish derricks are fully covered in order to protect workmen from the extremes of winter weather. Each derrick is in fact a double derrick, the twin structures having a common apex. This is necessary because, the bull-wheels being placed away off to one side, several paces behind the band-wheel, the second derrick is needed to brace the first and protect it from the one-sided pull exerted by the bull-wheels. The bailing line extends out over the belt house, running through a little trough which is designed to catch drippings of mud, water, and oil.

Many Changes Made

Polish engineers, whose first efforts have been to improve their own process before considering foreign ideas, have made many changes in their drilling machinery during recent years. The entire rig has been redesigned toward the end of greater efficiency at suitable working speeds; and, among the more progressive operators, electrical power has been substituted for steam. These new rigs, which are driven by 125-h.p. German-made motors operating through reduction gears, appear to be—and doubtless are—very much more efficient than the old-style steam-driven rigs.

Many advances have been made in the metallurgy of drilling tools. In the old days, when there was plenty of oil and plenty of time, bits and other tools were made of whatever metal came to hand. What did it matter if they spent 30 to 40 or more months on each well? Labor was no item, with drillers earning only $40 to $50 per month, including salary and bonus.

It is the engineer, new-comer in the oil industry, who is responsible for the changing order in Poland, even as in America. Nowadays, in the former country, the oil industry is almost entirely in the hands of technical graduates. Every man from the tool-pusher up has had engineering training.

Engineers wield the dominating influence in the oil industry of the country; and just now they are busily engaged upon revamping it to suit their own ideas. Drilling machinery has been re-designed, manufacturers have been required to improve the quality of steel supplied in drilling bits and other tools; and Jan, the driller, and Wladislaw, the tool dresser, have been made to hump themselves in response to the dictates of ubiqui-

View taken in Borysław field, Poland

tious efficiency experts, stop-watches in hand,—so many seconds for each movement, every job to be performed in conformity with blueprints and diagrams. And, as if adding insult to injury, Polish drillers and toolies are soon to be required to submit to intelligence tests and psycho-analysis!

Engineers have done to the Polish drillers what the recording weight-indicators did to the American. Gone are the days of the lazy-bench!

Speed Up Drilling

Such efforts already have resulted in speeding up drilling processes, we are told; and, in certain districts, wells ranging from 4000 to 5000 feet in depth which formerly required from 36 to 43 months for completion are now being drilled in nine to 15 months.

Polish drilling conditions are described by engineers of that country as the most difficult in the world, the formations consisting of very hard and very soft rocks alternating in such sequence as to present difficulties both to percussion and rotary tools. The younger producing horizons at Boryslaw are reached through an over-lapping overthrust of older and extremely hard rocks,—rocks hard enough in some instances to cut glass. The stratigraphic column includes lime rocks, hard and soft sandstones, and shales which occur in steep dips and at sharp angles. A typical drilling problem is encountered when penetrating a soft heaving formation occuring below a hard broken formation, as when passing from the over-thrust to the younger formations mentioned above. Caving in the soft formation creates large cavities roofed over by the hard broken rocks, which ultimately give way and fall down into the cavity, causing all sorts of difficult fishing jobs.

The Boryslaw Sandstone, principle oil-bearing stratum of the Carpathian region, is found at the base of the Oligocene. This hard sand rock is found at depths ranging from 2900 to 3700 feet in the older section of the Boryslaw field; from 4300 to 4900 feet in the Mraznica section; and from 5500 to 5600 feet in the southern extension. Drilling depths are increasing, as development extends down-structure; and the capacity of the Austro-Galician rig is being tested to the limit. Other formations which irregularly carry oil include the Menelitic Limestone, a poorly-saturated rock lying above the Boryslaw Sandstone, and the Gamma Sandstone of Cretaceous age which is productive in some localities of fairly substantial production.

Rotary Tried In Past

Rotary equipment was given a second trial about six or eight years ago, before the development of methods and appliances which made possible the conquest of hard rocks and crooked holes; and was abandoned largely on account of crooked holes and the high cost of imported rock bits and cones. Polish operators have been accustomed to employ only those tools and appliances which can be manufactured or duplicated in their own country; and the metallurgy of the rock bit was beyond the capacity of their manufacturers.

Nevertheless, rotary equipment of postwar design operated by Polish drillers trained in foreign service is now being tried again, with satisfactory results, in one of the outlying districts; and it is practically certain that one or two modern outfits manned by American drillers will be imported during 1930-31. The success of modern machinery in the neighboring country of Roumania has made a profound impression on Polish operators; and, if it can be proven that modern American machinery can drill straight holes through the extremely hard rocks at footage and casing costs which compare favorably with those of the Polish-Canadian system, it is to be expected that Polish drilling methods may also be revolutionized.

While it is doubtless true that rotary drillers have nowhere encountered such difficult stratigraphical conditions as those obtaining in Poland, it is also true that no other country offers such tremendous opportunities for the saving of time, labor, and casing. Wells less than 5000 feet in depth usually contain from 12,000 to 14,000 feet of casing of large diameter. Customarily, about eight strings of pipe are used, as follows:

Casing Program

Approximate Diameter In Inches	Depth
20	50- 65
18	195- 230
16	390- 600
14	975-1135
12	1400-1500
10	1950-2450
9	3000-3250
7	4300-4400

Wells are usually finished with a diameter of seven inches, although one of the proposals now before the engineering bodies is to increase this diameter. Clay is used instead of cement to shut off water behind the casing. In the old days water shut-offs were imperfectly executed, with the result that operators in the older fields have still to contend with a difficult problem in de-hydration of "cut" oil. Nowadays, greater attention is given this important matter, with the result that few failures occur. The cementing of casing, however, is also one of the items on the agenda of the crusading engineers.

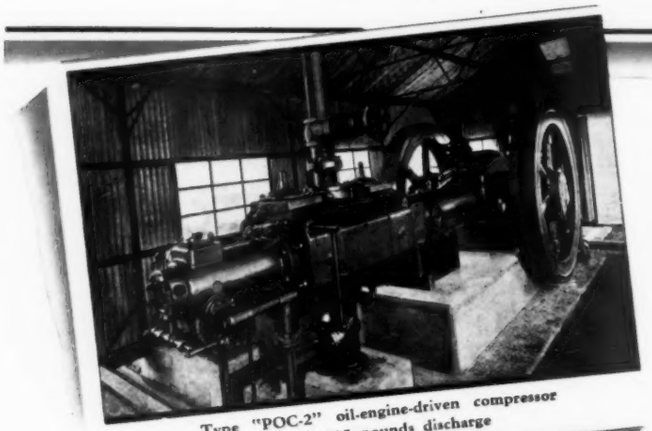
Wells are cased with inserted joint pipe of Czecho-Slovakian manufacture, which is handled without elevators. Slotted lifting caps are laboriously screwed into each joint, which is picked up by means of a D-link arrangement fitting into the parallel slots.

One of the most urgent demands for the adoption of new methods of drilling in Poland is based on the fact that equipment now in use has just about reached the limit of its capacity, while drilling depths are expected to increase as the Mraznica field is extended southward, and as deep drilling is commenced in the many shallow fields of the country. At present, the deepest well in Poland—a dry hole—is only about 6500 feet; and the deepest producing well is 800 feet shallower.

While it is the opinion of the writer, and fully shared by leading Polish engineers, that modern rotary equipment can be expected to solve the problems of hard rocks, soft shales, and crooked holes, it must be admitted that this confidence is based largely upon recent improvements in drilling practice. Under the heading of recent inventions which might be expected to contribute to the success of rotary drilling equipment in Poland, should be mentioned hard surfacing alloys, weight indicators, straight-hole drilling methods, and hard-rock core drills. Rock-bits, while not of recent invention, will doubtless prove to be the most dependable tool of the rotary driller in Poland.

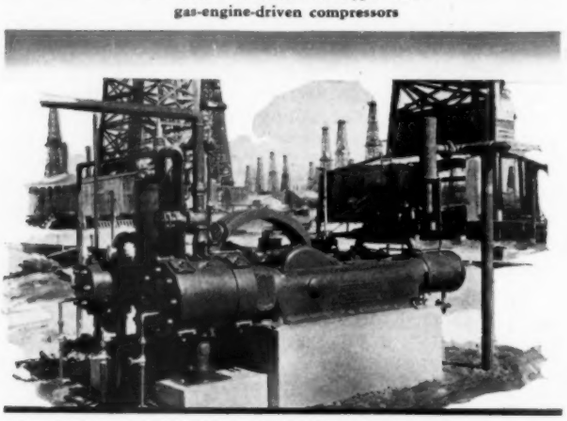
In a later issue will be presented on article dealing with entry of cable tools into Poland, written by T. S. Szwabowicz, an engineer who has returned to Poland after experience in the United States.

Reliable Equipment for the Oil Industry



Type "POC-2" oil-engine-driven compressor for 80-315 pounds discharge

Rumanian installation of Type "XG" gas-engine-driven compressors



Type "XPV" steam-driven compressor

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Cameron Pumps—Direct-acting or centrifugal types for boiler feed, for pipe line and loading rack service, for handling water, mineral seal oil, hot oil, gasoline, and for general service.

Oil Engines—From one to 6 cylinders and up to 1,200 horsepower. For driving pumps, compressors, generators, etc.

Rock Drills and Concrete Breakers—Sizes suitable for every service on pipe line construction and for general excavation and demolition work around plants.

Drill Steel Sharpening Equipment—Sharpeners, oil furnaces, etc.

Pneumatic Tools—Riveting, chipping, and calking hammers; drills, grinders, hoists, saws, etc., for tank and general field construction and maintenance.

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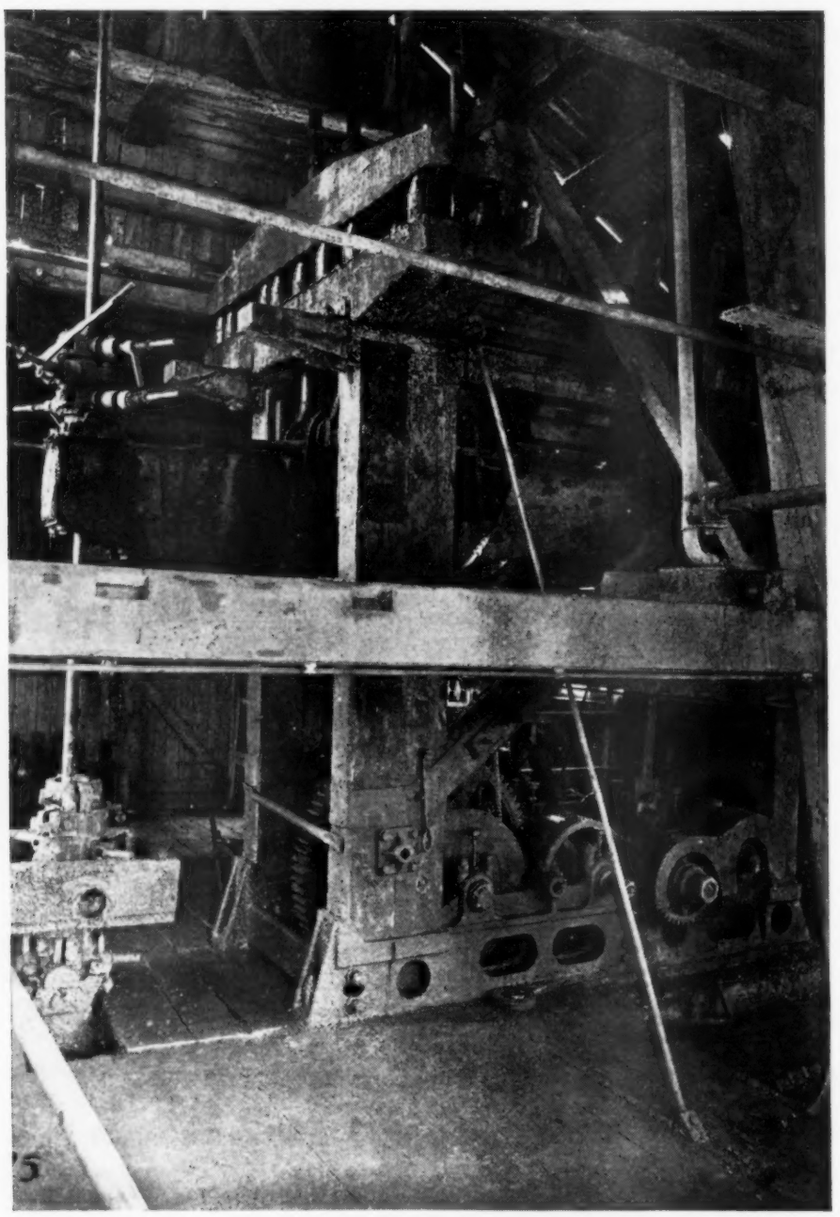
Secrecy Keeps German Operating Advances Largely Individual

IF leaders of the American oil industry could swap visits with leading German petroleum engineers, the resulting exchange of ideas might bring about some beneficial changes and improvements in the operating methods and practices of both countries. One cannot predict that the conservative Germans might adopt the rotary or cable tools, or American, the Fauck or Raky systems; but there might be certain little wrinkles and pointers which could be exchanged with profit to all.

Approaching the subject with an open mind, one is impressed with the fact that German operators are firmly entrenched in their convictions as to the superiority of their percussion-slush methods of drilling; and one would need experience with both before attempting to judge between German and American drilling methods. One learns that the best German drilling records average about 100 feet per day of elapsed time in drilling to depths of 2000 to 3000 feet, which is pretty good well-digging in any man's country and is entirely satisfactory to an operator who is not pressed for time, since his drillers receive only 250 to 300 marks ($60 to $72) per month, and whose investment in drilling machinery is very much less than would be required in the case of rotary equipment.

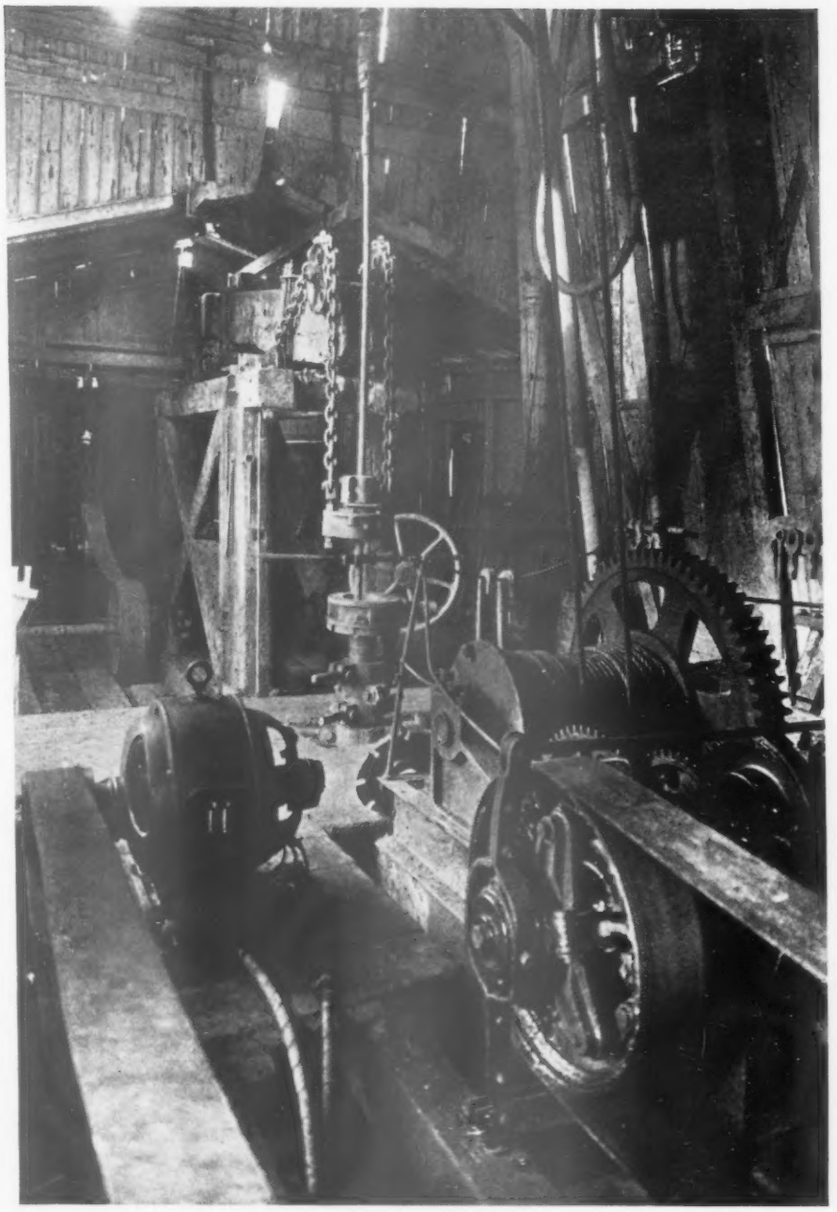


Raky rig, one of the types commonly used in German and Alsatian oil fields. Note bed of springs from which the walking beam is suspended

The basic principle of all the German drilling methods is that of percussion; but pipe of small diameter is used in lieu of the cable as developed in Pennsylvania. Fluid is circulated, as in the case of the rotary system. Sometimes the walking beam is up under the crown-block—and then one sees the derrick do the shimmy like nobody's business. Some of the German rigs are unbelievably fast, developing a speed of 90 to 100 strokes per minute, with strokes running from four to 20 inches in length. One is inevitably reminded of the wood-pecker, upon seeing such a rig in operation.

Little space will be devoted to German drilling practices, as no doubt English-speaking readers will be as intolerant of them as the Germans are of American methods. It is sufficient to say that no two are alike. Some look like a cross between a hay-press and a cotton-gin; others look like a standard rig that has been mixed up with a rotary rig and a cyclone.

The language barrier, and the



Fauck rig, one of the types commonly used in German and Alsatian oil fields. Note that small-diameter drill pipe is used in lieu of the cable employed in Pennsylvania

fact that the literature of the oil industry is largely printed in English, serves as a great handicap to German operators. One supposes that they have probably heard that the Americans or some other "auslanders" have developed a new system of drilling by means of which the drill pipe and bit are rotated instead of being jiggled up and down in the hole; but one can find no visual evidence thereof, as, with the exception of one rig used by an American group, the rotary is yet unknown in German oil fields. Not so in German factories, however. German manufacturers are regularly turning out rotary equipment of modern design which is almost indistinguishable from American equipment. Such machinery, however, is sold entirely in the export trade, as local operators will have none of it.

Formations encountered in the Northern Plain include lime rock, hard chalk, and hard and soft shale. All of these rocks can be negotiated with modern rotary equipment; and it is the intention of the American group now embarking upon a campaign of activity in Germany to use that type of machinery. One can readily see why the percussion-slush systems were developed, however, as some of the formations are soft and unstable for which the circulation of fluid is indicated, and others are hard and ideally suited for the percussion method.

Operate More Frugally

German producers certainly operate more frugally than Americans. Whether or not they operate more economically is a question which cannot be answered without reference to drilling and lifting costs, for which figures are not available. Differences in wage-scales would rob such figures of any value which they might have for comparison with American production costs.

There are many ingenious devices, such as radially-operated central hoisting stations, triggers for dumping bailers by remote control, flexible bailers, and so forth—little wrinkles which the Germans have developed to meet peculiar conditions obtaining in their fields.

Holes in the Nienhagen field are very crooked—so much so that flexible bailers must be used to secure their production. Bailers only 12 meters long are made in three sections with two flexible joints so that they will worm their way in and out of the crooked holes. The workmen have rigged up triggers by means of which these bailers may be dumped by remote control. Production is collected into central lease tanks by means of open wooden sluice troughs, no thought being given to evaporation.

Existing wells probably could be operated by no other means. If screen pipe were inserted to prevent the emission of sand, the holes would still be too crooked to permit their operation by means of ordinary pumping equipment. As for the open troughs, they are necessary so that the sand may settle out before the oil reaches the concentration tanks. The Germans are victims of a vicious chain of conditions which cannot be altered without revolutionary changes in operating methods, the greatest need, apparently, being for straighter holes.

The Germans build their steel tanks in a manner which seems very peculiar. They commence with the roofs and finish with the bottoms, jacking up the shells as each ring of staves is added.

The frugal Deutschlanders let no drop of oil go to waste. Horse-drawn tank wagons are used to gather production from small outlying wells not served by pipe lines.

No Exchange of Ideas

There has been some progress in the development of German operating methods; but it is entirely not co-ordinated,

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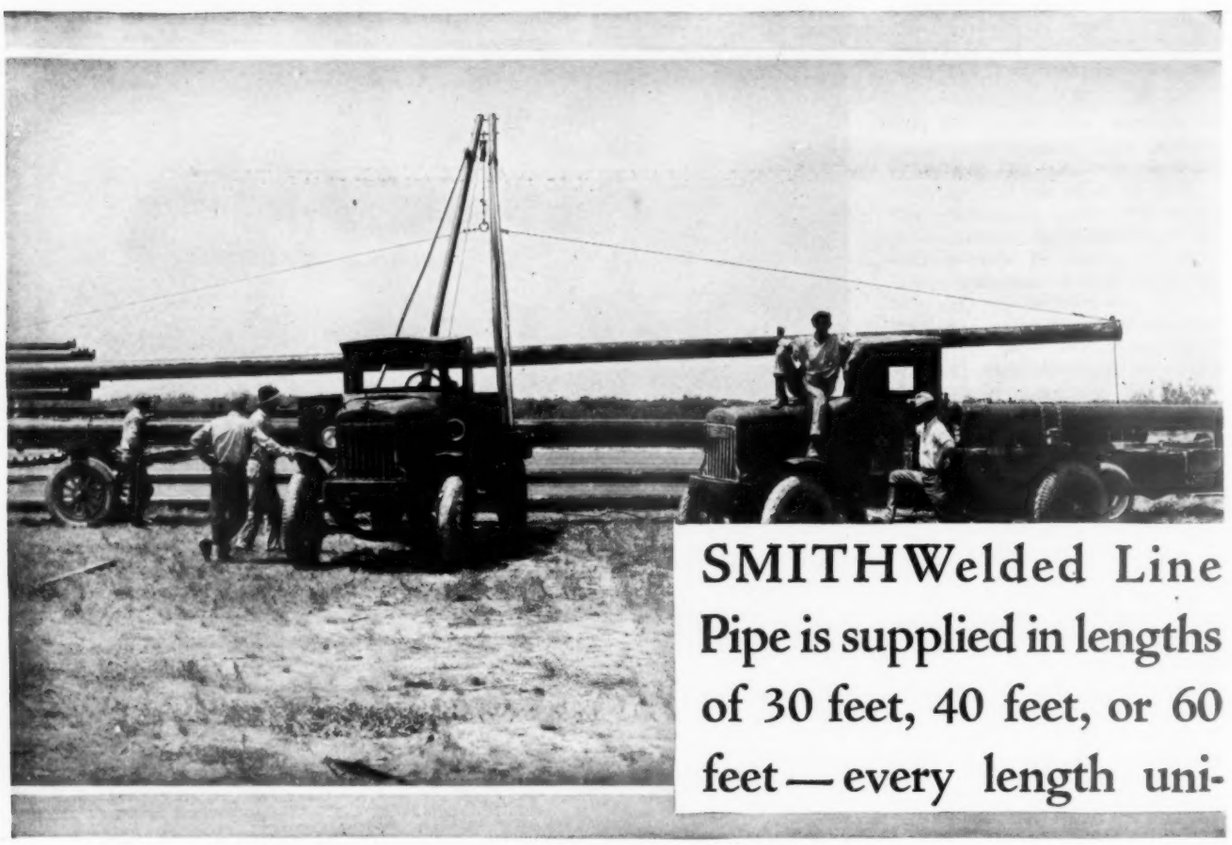

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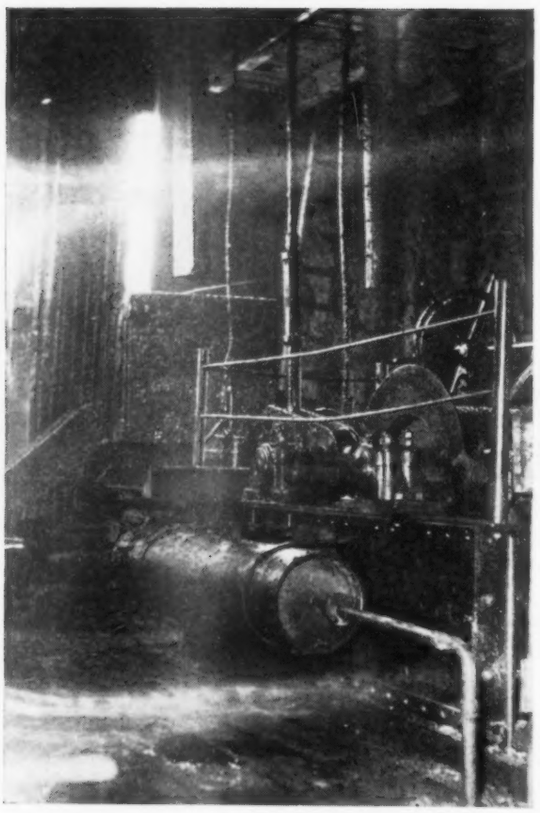


Kabelschlag (cable-percussion) or Schnellschlag (rapid-percussion) rig used in German drilling operations

each operator advancing independently and jealously guarding his secrets and inventions from his neighbors. "Verboten" signs abound. Each drilling operation is fenced off and closely guarded; and there is little or no exchange of ideas or of data. The result is that each district, and some times each lease, has been developed along different lines. Each operator seems to strive to develop a secret process which he may call his own and which, as he fondly believes, will give him an advantage over his neighbor.

Nevertheless the Germans do have certain machines and methods which probably could be adopted with profit in America. They have made great progress in the development and use of electrical power and Diesel engines.

The Deutsche Erdol-Aktiengesellschaft pulls its shallow wells by means of a portable electric hoisting machine, manufactured in Germany, which is no higher than a man's waist and no longer than the span of a man's arms. It can be trundled around like a wheel-barrow from one well to another; and it operates with marvelous efficiency. It can be set up, bolted down to its foundations, and placed in operation in 10 minutes.

This machine stands out in contrast with manually-operated hoisting equipment which was used in the early days of the Oelheim Field. It must be remembered that at that time, however, their American contemporaries were also using manpower to do work now done by machinery, as the Pennsylvania pioneers were still "kicking" their wells down by means of spring-poles.

The D. E. A. Company has developed a central hoisting machine for pulling tubing and rods from closely-spaced shallow wells in the Wietze field. This consists of an electrically-operated hoisting drum mounted on a revolving foundation, made somewhat like a locomotive turn-table, from which the bailing line extends out across country to wells located within sight and hailing distance of the operator on duty at the station. When a well at one point of the compass has been pulled and restored to operation, the hoisting apparatus is shifted to point in another direction, and the line is re-strung to another well; and so on. What matters if the gang-pusher works at the hoisting station and the roustabout crew at a well several hundred yards away?

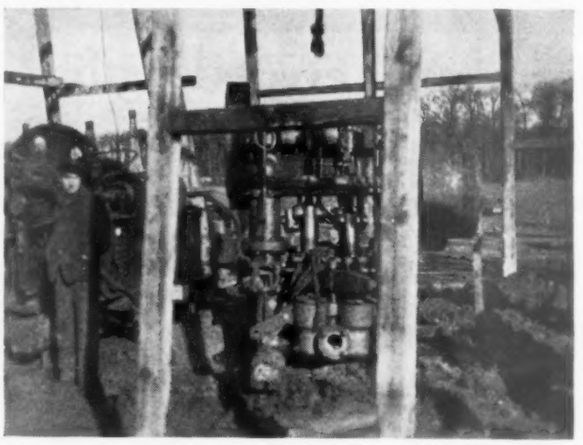
Diesel Engines

In the matter of oil-field power, the Germans are probably one jump ahead of Americans, as they employ Diesel engines to much greater extent. And it may be added that German manufacturers are still several jumps ahead of their domestic customers, the German operators, in this respect, as they have devised means for the employment of Diesel power in connection with rotary equipment. One of the leading German manufacturers has patented and placed in operation a rotary rig which is driven by means of a powerful water-turbine operated by a centrifugal pump which is ideally suited for operation by Diesel or other forms of power. As the Germans have not yet adopted rotary equipment, one must wait until

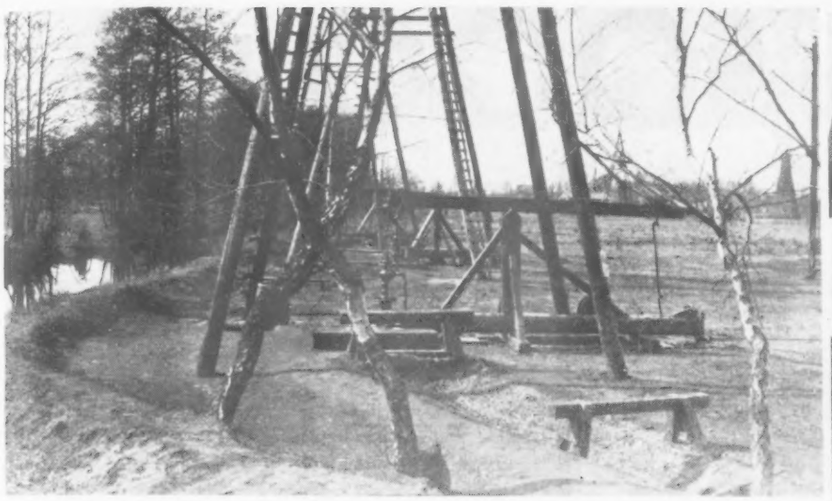
IT has been said that German brains have not yet really been applied to oil, the inference being that the thorough-going Teutons may accomplish great things if ever they are aroused from the lethargy which seems to characterize their attitude toward petroleum. If the German mental horizon has been circumscribed with respect to oil, it is only partially so, as they have undertaken some daring and unusual experiments from time to time. Chief of these is the development of the oil-mining process, as practiced at Wietze and Pechelbronn; and, although fully conscious that we probably shall not live to witness its fulfillment, we hereby make the prophecy that American engineers may one day come to Germany and France and learn how to recover the major percentage of our petroleum resources now being left underground.

One of the most interesting features of our German investigations was the story of a derrick built 1950 feet below the surface of the ground, from which point a well 2440 feet deep was drilled, reaching a total depth of 4390 feet from the surface. The operation was carried out by the Deutsche-Petroleum-Aktien-Gesellschaft, whose engineers utilized an abandoned mine at Hope to carry out this interesting experiment. Having a shaft 600 meters deep, why waste 1950 feet of hole? A gallery of the proper dimensions was excavated in a suitable formation. Timbers and tools were lowered by the mine's regular hoisting equipment; the derrick was erected in the gallery; drilling machinery was brought down; and drilling was carried on underground, very much as at the surface. Unfortunately, the test was a failure. One would say that it deserved success.

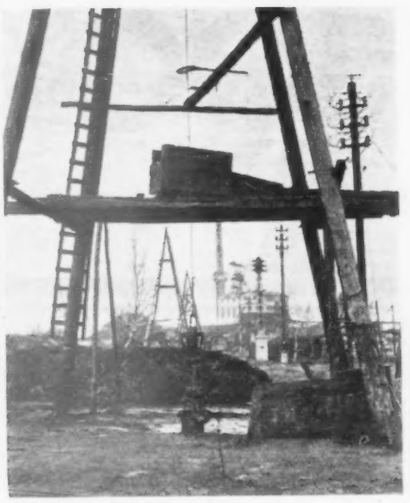
R. E. L.—



Slush pumps of the type commonly used in connection with the percussion-slush methods of drilling as employed in Germany



Pumping wells, Wietze field



Wells are bailed by remote control in the Wietze field. Note trigger-arrangement for dumping bailer

Drilling operations are closely guarded in Germany. Note fire fence excluding "auslanders"

Sluice troughs serve in lieu of flowlines, Wietze field, Germany

Pumping well, Oberg field, Germany

Pumping well, Wietze field

300 to 5000 Ft.

300 FEET

This rig is designed for shallow water wells and geological work, with a drilling depth of 300 feet. The entire rig, consisting of derrick, rotary, drawworks, pump, swivel, power unit and accessories is mounted complete on the new Model AA 1½ ton Ford, Special 10 wheel truck with 4-speed transmission.

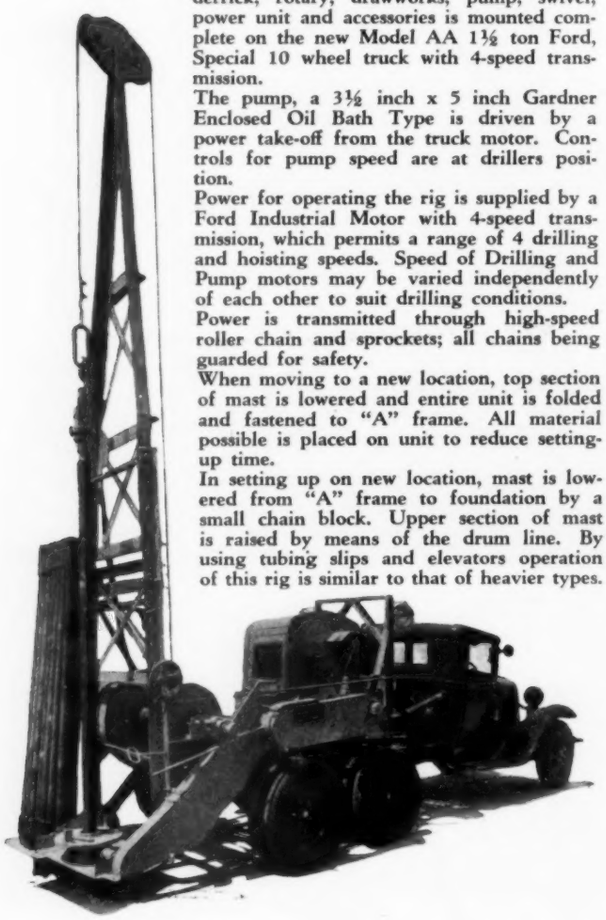
The pump, a 3½ inch x 5 inch Gardner Enclosed Oil Bath Type is driven by a power take-off from the truck motor. Controls for pump speed are at drillers position.

Power for operating the rig is supplied by a Ford Industrial Motor with 4-speed transmission, which permits a range of 4 drilling and hoisting speeds. Speed of Drilling and Pump motors may be varied independently of each other to suit drilling conditions.

Power is transmitted through high-speed roller chain and sprockets; all chains being guarded for safety.

When moving to a new location, top section of mast is lowered and entire unit is folded and fastened to "A" frame. All material possible is placed on unit to reduce setting-up time.

In setting up on new location, mast is lowered from "A" frame to foundation by a small chain block. Upper section of mast is raised by means of the drum line. By using tubing slips and elevators operation of this rig is similar to that of heavier types.



1200 FEET

For every drilling depth, the Portable Rig Co. has a rig built especially for that job. For 6 years we have specialized in the building of portable drilling rigs. Our entire resources have been concentrated upon improvements in design, construction, and operation. Skilled engineers and experienced practitioners have sought constantly for methods of doing standard jobs better and new jobs more efficiently. To drill with Portable Rigs is to effect large savings in fuel expense. With the exception of the geological rig which is mounted on a Ford truck, all are operated with natural gas or gasoline, either fuel usually being obtainable at a very reasonable cost. This is a decided advantage when operating in isolated locations, and a favorable circumstance even on ordinary locations, as the fuel consumption is invariably less for these Portable Rigs.

This rig can be furnished for use with a steel mast as illustrated or a small derrick if preferred. The Engine, Draw Works, Pump and Mast are all mounted on a heavy steel wagon, which is equipped with wide flange wheels for moving over soft ground.

This type of Rig we furnish complete with steel Rotary, Oil Bath Swivel, 26-ft. Grief Stem, Rotary Hose and all equipment except Drill Stem, Bits and small tools. We can furnish independent bailing reel for use in operating new style Collapsible Bits, eliminating the necessity of pulling drill stems to change bits or take cores. Write for Bulletin No. 200.

Portable Rig C

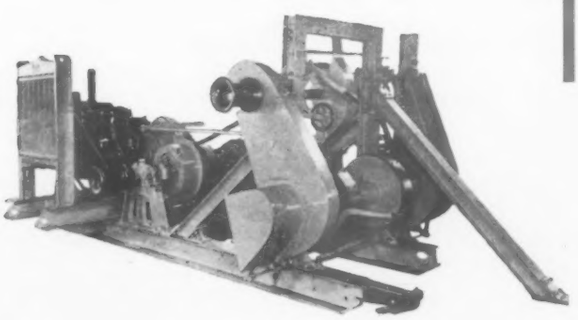
HOUSTON, TEXA

Portable Drilling Rigs

2500 FEET

When moving, a minimum of break-down and set-up time, as well as difficulty in transporting is required. Rigs are built in sections which may be quickly and easily dismantled and hauled on an ordinary oil field truck. As each unit or section is complete on a substantial base, proper alignment is maintained regardless of the number of times the rig is moved. These units are tied together and made rigid by special turnbuckles.

The extensive use of Portable Rigs under most trying conditions has repeatedly proven their merits. They have speed—power—economy—ease of transportation—and all the flexibility of other type rigs plus many other advantages which will be found in the bulletins issued on each of the various rigs. Any or all of them will be sent on request. Just write.



entire Unit is mounted on one structural steel frame, and in moving from one location to another it is not necessary to Illustrated above is our Three-Speed Draw Works Unit. This tear down the Draw Works. This Rig is designed for use in connection with any size or type of derrick desired and can be furnished with 60, 75, 100 or 125 h.p. engine to suit customers' requirements. It is built entirely of steel. Write for Bulletin No. 200.

5000 FEET

The 5000-ft. Rigs are made in two types—Extra Heavy Duty (upper illustration), powered by a Waukesha Great Six 300 H.P. engine, and the Heavy Duty (lower illustration), powered by two 125 H.P. Waukesha engines.

On the Extra Heavy Duty Rig, power is transmitted by Texrope drive to reverse clutch unit, thence to drawworks by means of split-type sprocket. The reverse clutch unit is all-steel construction, operating on both Timken and American Roller Bearings. Reverse clutch is oil bath type with steel cut gears and hardened pinions.

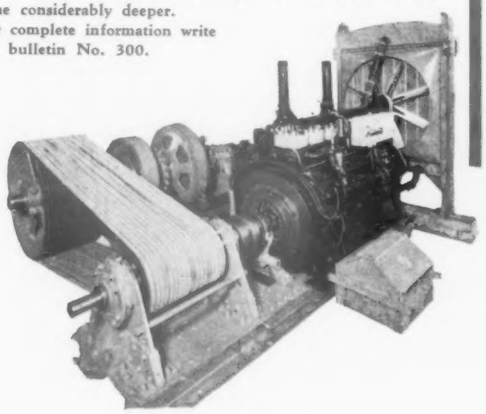
While it is designed for 5000-ft. depths with 6-in. drill stem, it has gone deeper in several cases. Bulletin 500 gives complete details. Write for it.

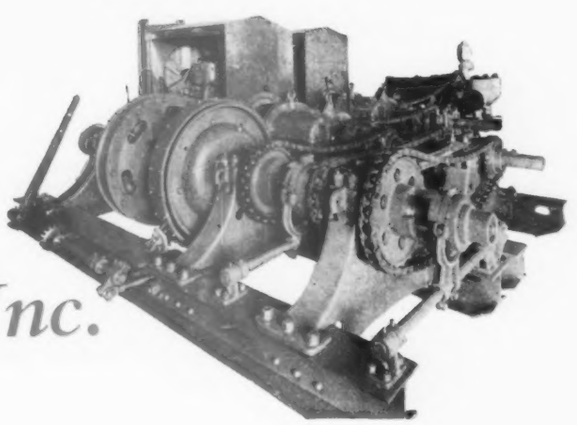
The Heavy Duty Rig consists of 4 sections, viz.: Two engines, pump and reverse clutch, mounted separately and easily moved on ordinary oil field trucks.

In the hook-up pictured the power of either or both engines, singularly or simultaneously, can be used to drive the slush pump or diverted to the drawworks, as desired by the operator.

The reverse clutch unit is equipped with three steel clutch sprockets to drive from the engine unit, through which three distinct speeds are secured to line shaft on drawworks. This rig is designed for depths to 5000 feet with 4-in. drill stem. There are instances, however, of it having gone considerably deeper.

For complete information write for bulletin No. 300.





ompany, *Inc.*

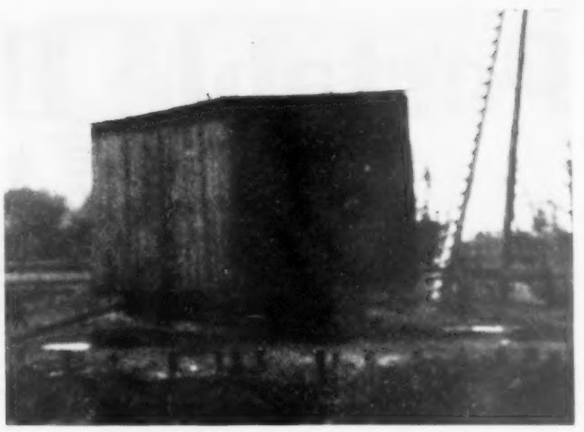
E X A S, U. S. A.

one reaches Roumania to see this rig in service. Its sponsors make important claims in its behalf, including flexibility, high speed, great pulling power, and low fuel economy.

Twin-cylinder Diesel engines of the type shown in the accompanying illustration are very popular among the users of the Fauck, Raky, and Schnellschlag types of percussion rigs. They certainly are less cumbersome and more easily transported than steam engines and boilers; and they will run all day on a hat-full of oil.

Holes in the Nienhagen field are so crooked that flexible bailers must be used to secure the production

Another German device which would be of interest to American operators of cable tools and spudding machines is known as a "rotation car," if one may translate literally. Its purpose is temporarily to convert the cable—or percussion—tool type of rig into a rotary machine for the taking of cores. Essentially it is nothing more than a rotary table mounted on a hand-car which may be pushed on and off the derrick floor as required. It is equipped with two vertical arms about 3½ to four feet long, protruding upward from the rotary table, which engage two horizontal arms clamped securely to the drill pipe, thus imparting the rotary movement. Rotary operators in Trinidad and elsewhere use posts and clamps of the same type when drilling in with flush-joint drill pipe against high gas pressures. It is a belt-driven apparatus, which derives its power from the same source as the cable—or percussion—tool equipment. Sometimes it is mounted on rails up in the derrick, at about the usual height of the single-board, above the walking beam and temper screw. When a core is required, the rotary car is pushed over the hole; its belt is placed in position, core barrel and drill pipe are run in, whereupon coring operations may be commenced forthwith.



Central hoisting station, Wietze field, Germany. A hoisting drum operated by an electric motor is mounted in a revolving structure from which bailing lines are extended to wells located within a radius of several hundred meters

In the case of percussion rigs, drill pipe and slush pumps are always available; otherwise tubing or line pipe of whatever diameter is at hand may be used for coring in shallow holes. German manufacturers even supply a tiny slush pump for use while coring with cable-tool rigs or spudding machines. The whole outfit is very simple and inexpensive, and is readily portable from one job to another; yet it is said to have a capacity of 4000 feet. It was developed primarily for use in coring for salt, potash, and coal deposits; but it is also very useful in certain types of oil operations.

Compact portable pulling machine used in the Wietze field, Germany

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"OUTSIDE CUTTING TOOL"

is faster and simpler in operation makes cleaner cuts and performs unfalteringly under all conditions.

For many months this new OUTSIDE CUTTING TOOL was being perfected and tested in numerous oil fields under varying conditions. AND NOW THAT IT HAS SUCCESSFULLY PROVEN ITS MERITS IT IS READY FOR USE BY THE OIL INDUSTRY.

The new perfected OUTSIDE CUTTING TOOL is the product of a master driller whose ability along this line has been demonstrated by the success of his inside cutting tool. Your assurance of satisfaction with the new OUTSIDE CUTTING TOOL is guaranteed by these experiences and past successes.

J.S. Abercrombie Co.

21ST FLOOR GULF BLDG.
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RED BALL CUTTING SERVICE

J.S.A.1

Economize when *with* Parkersburg

The above Rig is all-steel and all-Parkersburg; A.P.I. Derrick, Band Wheel, Calf Wheel, "A" Frame, Jack Posts and Sampson Posts, "ICR" Walking Beam and "HB" Pitman —all built for lifetime service.

WHETHER it's to drill or pump, when it's time to standardize it's time to give an extra thought to economy. That's the time to consider "yearage" of service as well as "dollarage" of cost. That's the proper time to equip for enduring economy with Parkersburg Quality Steel Rig Fronts which are "good for the life of the well and more."

That's the time to call in the Parkersburg man near you. Let him show you the advantages of this modern all-steel equipment which cuts costs by better performance and longer life. These trained, experienced specialists in matters of Rig Equipment are always at your service. You will find them ready, willing and well informed on conditions in your field. Let one of them point out the savings of Parkersburg Quality. You can depend on the extra strength, advanced design and enduring service of this equipment which is "Engineered for the Job."

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Portable Drilling Machines (Wood and Combination-Steel)

Chain-Driven Sand Reels and Bailing Reels

Steel Wheels— Bull, Calf and Band

All-Steel Standard Rigs

Bolted Steel and Aluminum Tanks

Miscellaneous— Drilling Equipment Steel Walking Beams and Pitmans

We Subscribe to A.P.I. Standards

THE PARKERSBURG RIG AND REEL COMPANY

you Standardize Steel Rig Fronts

Proven In Practical Use

PARKERSBURG Products are built to the requirements of the field. Practical Oil Men, Field Engineers of wide experience and Expert Structural Designers have combined their talents in perfecting this modern Steel Equipment. "Built by Parkersburg" adds the final assurance of Quality, Accuracy of Construction and Dependable Strength to serve with utmost Satisfaction and Economy.

These facts are established beyond question. Parkersburg Rig Equipment has been tried and proven in practical use for more than thirty-three years in Oil Fields throughout the World. It has always brought users definite economies in better performance and longer life.

Quality and Service

QUALITY always pays. There is no substitute. In Oil-Field Equipment by Parkersburg, Quality is linked with Service—Service from the Product in use, Service from the Manufacturer, and cheerful, prompt and helpful Service from Parkersburg Representatives in every field. This threefold follow-through to satisfaction is the pledge and practice of the Parkersburg Organization.

Parkersburg Quality and Service are maintained for *you*. For complete Production Rigs, from Derricks to Tanks, call the nearest Parkersburg Representative.

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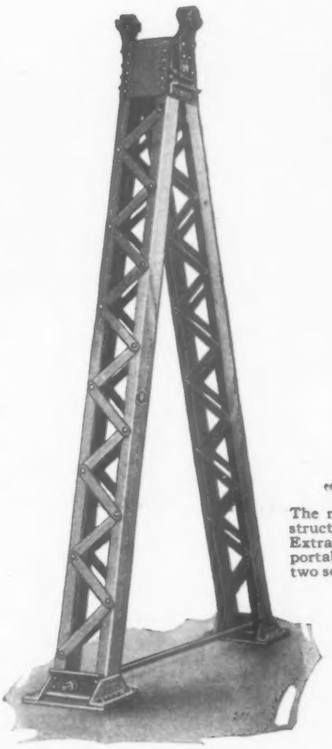

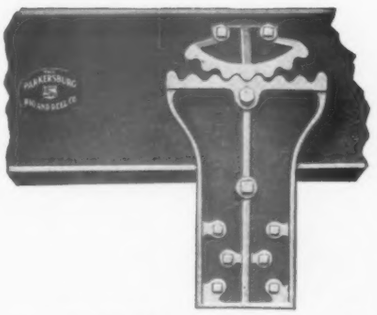

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FIGURE 7
Surface equipment Clemenceau Pit, Pechelbronn oil mines, Bas-Rhin, France

French Mining Method Points Way *to* Complete Recovery

AMERICAN petroleum engineers may one day go to France and Germany to learn how to recover the greater part of our petroleum reserves now left underground.

It is true that such an eventuality seems very remote, indeed, in this day of over-production and abysmally low crude values; but it is comforting to know that, if a day should come when no more flush fields like Seminole, Oklahoma City and Kettleman Hills are to be found, we may be able to resort to a change in operating methods which will make available the billions of barrels of oil which cannot be recovered under present American practice.

Advances made by French engineers operating at Pechelbronn, Bas-Rhin, during the last few years have made European oil mining methods adaptable to American conditions.

Methods employed by German engineers who opened the Pechelbronn shaft during wartime and mined the actual oil sand itself in their desperate need for petroleum were possible only in a depleted area which had lost practically all its gas pressure, and would be entirely too hazardous if attempted under conditions of pressure usually obtaining in American oil fields.

German engineers, in the beginning at Pechelbronn, as they still do at Wietze, drove their galleries through the actual sand bodies at risk of death from the release of oil or gas under pressure from undepleted areas and isolated lenses and gas pockets.

FIGURE 3
Pit-head Clemenceau mine, Pechelbronn, France

French engineers, however, now avoid the sand formations entirely and drive their galleries through beds of marl occurring between them. From such advantageous points, bore-holes of small diameter are drilled to penetrate and drain the oil-bearing sands lying overhead and underneath. These bore-holes are in effect small oil wells, although some are inverted and other are drilled horizontally and obliquely at wider angles than any crooked hole faddist ever dreamed of. These bore-holes, being of short length and small diameter, can be closely spaced, thus permitting of far more intensive development

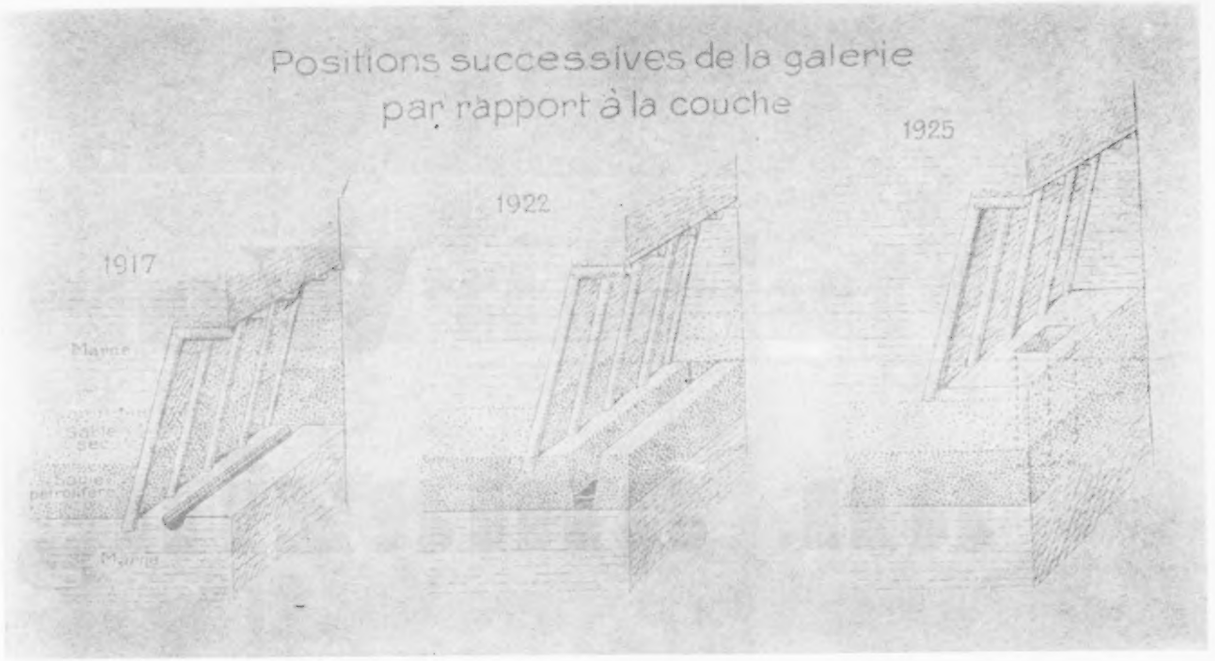

FIGURE 1

Showing successive stages of development in the placing of galleries—Pechelbronn

and drainage than is possible in drilling oil wells of the usual diameter and depth.

Although French engineers have made many recent advances, as will herein be explained in detail, European oil mining methods are not entirely of modern inception. A historical outline of the Pechelbronn operation made available by the Pechelbronn Societe Anonyme D'Exploitations Minieres reveals that oil has been produced in that locality for nearly 200 years; first by shallow surface mining methods, later by deep mining, followed by boring after the invention of drilling machinery, and again, since 1917, by mining. In other words, the French oil industry ante-dates the American by about four generations.

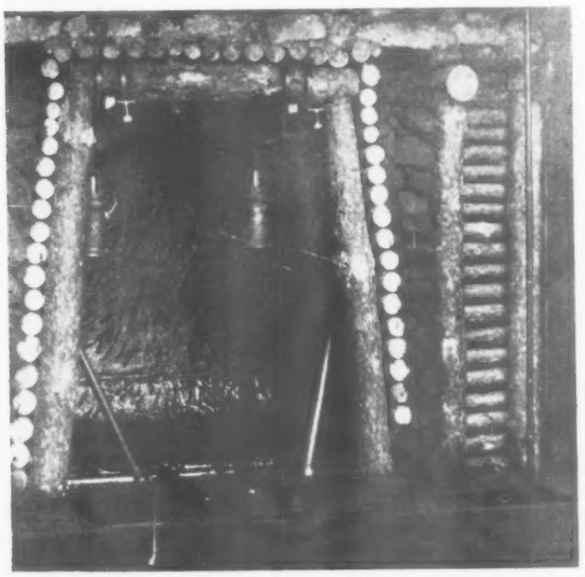

FIGURE 4

Typical cross-section of underground gallery, Pechelbronn oil mines, France. Note battery lamps hanging from roof; and oil sump and casing of vertical oil well seen at right

French Industry Antedates American

A literal translation of the above-mentioned historical sketch reveals in part that:

"The working of petroleum in Pechelbronn can be retraced for nearly two centuries past. The first method consisted in the excavation of strata containing petroleum in proximity of the surface. The very viscous oil could only be recovered by washing off the sand extracted with boiling water.

"Later on the working proceeded to the depths. Strata containing a more fluid oil which flowed by itself into galleries were discovered. This favorable phenomenon was unfortunately accompanied by violent irruptions of water and gas which endangered the safety of the working.

"In the meantime the working by means of boring had come into existence and when flowing wells were discovered the dangerous and unprofitable subterranean work was abandoned.

"During a period of about 30 years the working was solely done by way of boring; but here, as in other oil fields, it was expected that the borings would furnish only an insufficient output. The best way of finding out the importance of the oil quantities left was to penetrate by pits and galleries into the stratification. This meant a return to primitive methods, but with the prospect of being able to surmount the difficulties more easily owing to the progress made in mining technique. Besides, it was supposed that the borings had sufficiently purged the deposits of gases under pressure.

"A first pit of 150 metres in depth was excavated in 1917. As soon as the galleries had reached the layers the oil oozed out abundantly.

"However, impediments soon presented themselves which were much like those encountered in former times and which slowed down the development work, yet without bringing it to a standstill.

"Today, after 10 years of continued experience, the drainage of petroleum by means of galleries may be considered as quite an ordinary industrial operation, owing to the ameliorations with regard to interpretation of records of the old borings, to researches made by means of new borings, to the working methods, and to precautionary measures."

Exploitation by drilling was commenced more than 40

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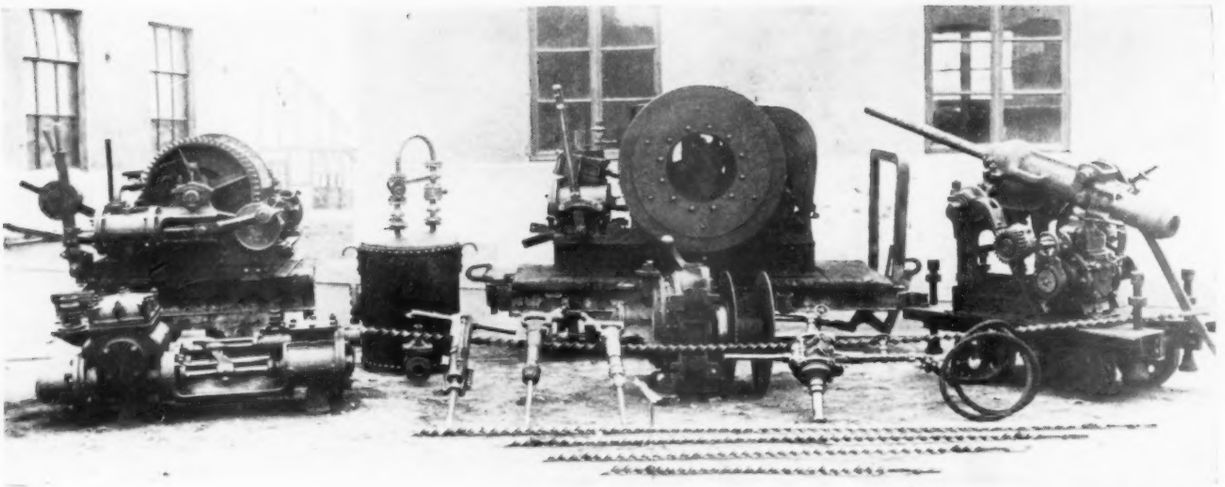

FIGURE 2
Tools and equipment used in oil mining operations at Pechelbronn, France

years ago, during which period some 300,000 tons of oil has been produced from approximately 600 wells. By American standards, at least, the field may be classed as having practically been depleted when mining was resumed in 1917. Yet modern mining methods have yielded almost as much oil,—250,000 tons,—in 13 years as was recovered by ordinary drilling and pumping methods in more than three times as long. Thus, we may say that oil mining methods have already doubled the recoverable percentage of underground reserves, with every prospect that future operations may bear out the commonly-accepted estimate that only about one-third or one-fourth of our total petroleum resources are recoverable by ordinary drilling and production methods.

Of equal importance is the statement that lifting costs, by the mining method, are no greater than by the drilling and pumping methods employed in the same field.

There are great numbers of shallow fields in the United States where conditions similar to those at Pechelbronn obtain, and where all dangerous pressures having been dissipated by previous drilling. The sinking of shafts to depths of 1000 feet or more offers no great problem to mining engineers, either European or American; and the driving of galleries through other suitable formations occurring in proximity to bodies of oil sand has been amply demonstrated by French engineers. It can be confidently predicted that, should oil values ever again reach the levels of the war-time and post-war periods, the industry may see the adoption of oil mining methods in the United States.

Germans Have Also Progressed

It is rumored that German engineers on the staff of the Deutsche Erdolwerke Aktiengesellschaft, which operates a similar oil mine at Wietze, in the German Province of Hannover, have also developed a new bag of tricks since their initial experiment at Pechelbronn; but, as we were not able to explore their underground workings, we can only speculate as to what these new methods involve. Certain it is that they still mine and wash the oil sand with hot water, of which latter operation we caught a glimpse at the surface. Inasmuch as they leave no drop of recoverable oil underground, they may be said to be more thorough than the French. Whether or not their production costs are as low as those of the latter is a question which cannot be answered without an examination of their respective books of account. It may be said, however, that if oil should ever become so valuable as to warrant such an extreme effort, the French will still be in position to mine and wash their depleted sands.

Important Advances

The important recent advances to which we refer are, first, the shifting of the galleries and other underground operations from sand to marl bodies, as has already been mentioned; and, second, the drilling ahead of prospect holes of small diameter to search out gas- and oil-bearing sands so as to guard against their unexpected penetration by workmen advancing with the driving of galleries of full diameter. This precautionary measure makes possible the plugging off or draining of high-pressure sand bodies under safe conditions, as contrasted to old methods where disastrous results sometimes followed the unexpected penetration by miners working 500 to 900 feet underground, of virgin sand reservoirs carrying oil or gas under pressure.

It is interesting to note, as will later be explained, that such undrained lenses and pockets do occur in a field which has been regarded as thoroughly depleted insofar as drilling and pumping operations are concerned.

It may be said that the Pechelbronn mining operation is of three-dimensional character, as these prospect holes are drilled at all angles and in all directions,—horizontal, lateral, vertical, perpendicular, and at all anges in between,—so that no oil- or gas-bearing body may escape discovery in ample time to protect the underground workmen. This method of advance may be likened unto that of a person walking in the dark, with hands outstretched to warn him of approach to dangerous obstacles. Prospect holes are of 50 millimeters (about two inches) diameter and, usually, of five meters in length. They are drilled at points on the advancing face of the gallery corresponding to the five spots on a die. The center hole points straight ahead; two holes point obliquely upward, to the right and left; and two others downward, to the right and left. One set of holes may be drilled thus, while the alternating set may be dif-

Gas drill, Pechelbronn oil mine, France

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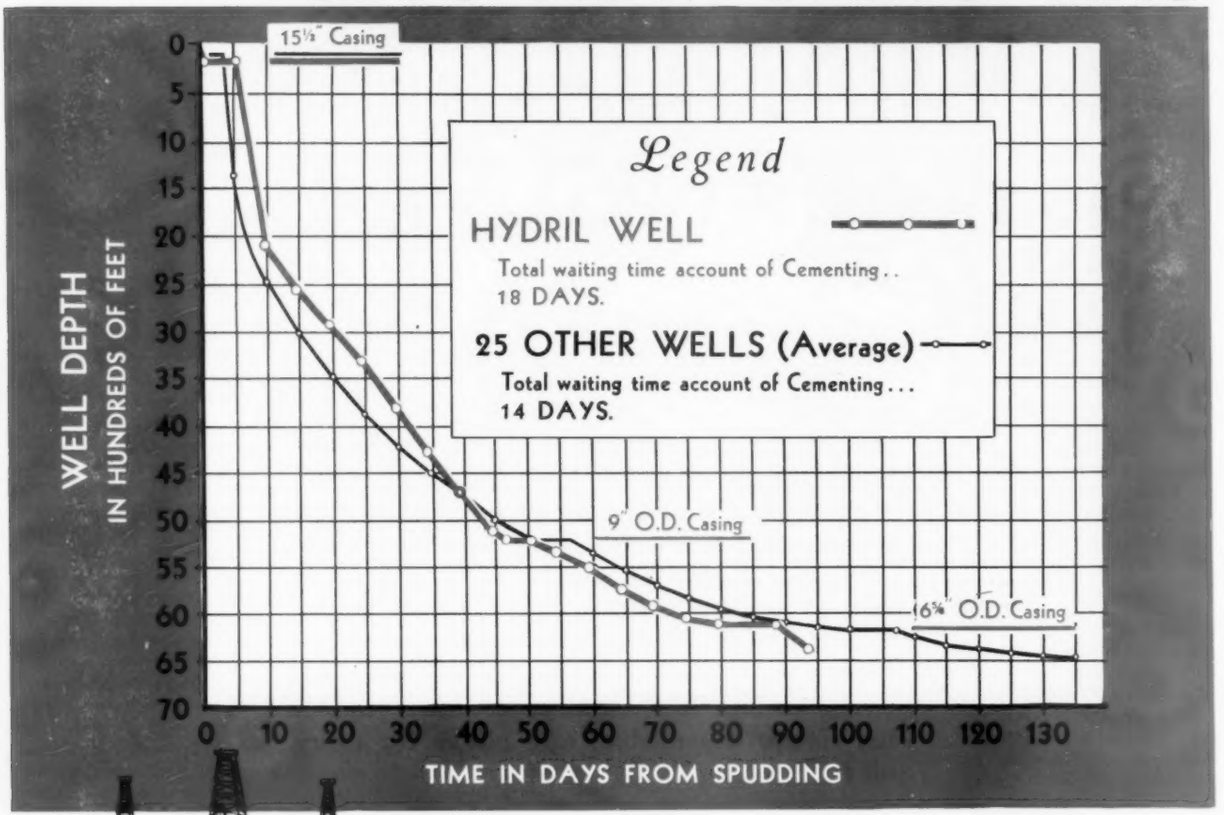
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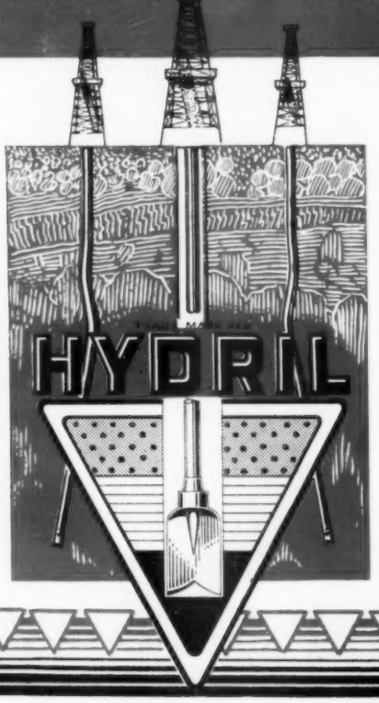
HYDRIL WELL
Total waiting time account of Cementing..
18 DAYS.
25 OTHER WELLS (Average)
Total waiting time account of Cementing...
14 DAYS.
WELL DEPTH
IN HUNDREDS OF FEET
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
0 10 20 30 40 50 60 70 80 90 100 110 120 130
TIME IN DAYS FROM SPUDDING



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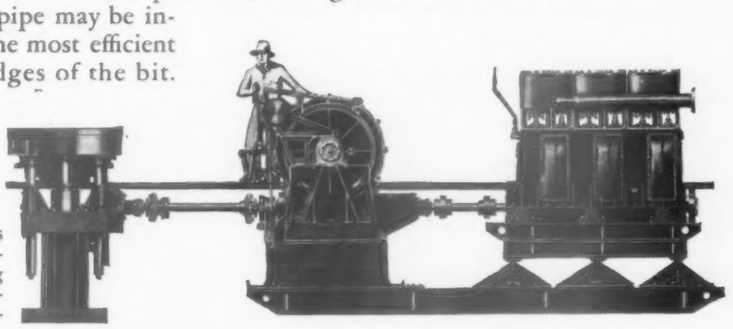

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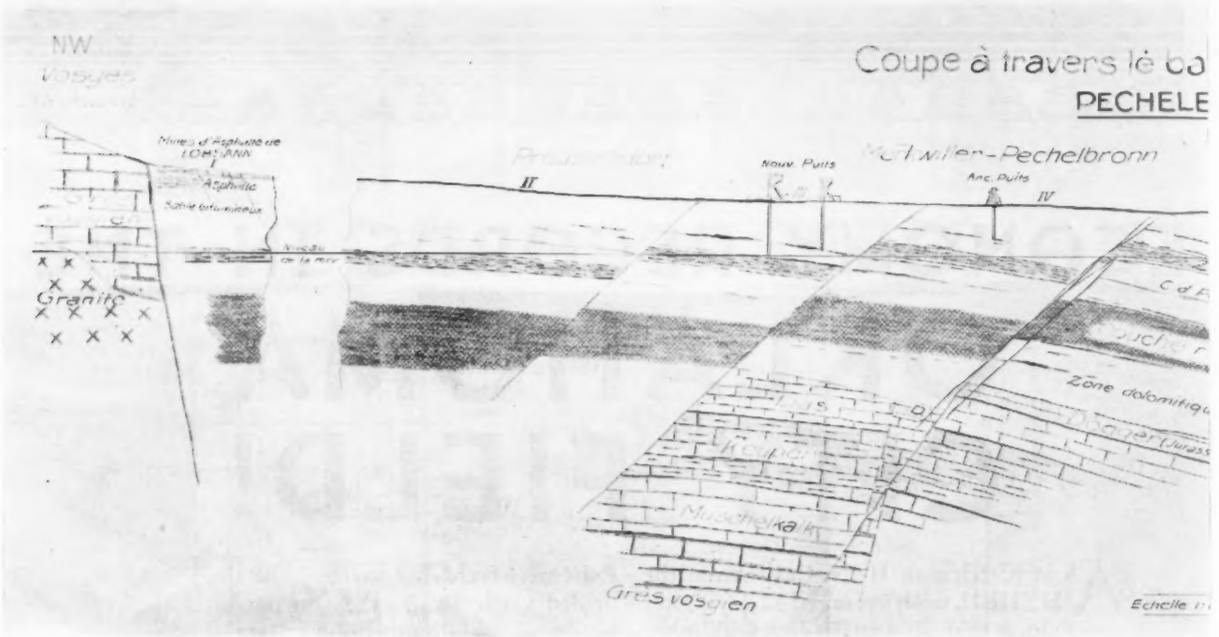


Geological cross section

ferently located, as at the centers of the roof, wall, and floor lines, in order that no small sand-body may escape detection.

Method of Controlling Pressure

The purpose of these prospect holes is to search out oil or gas pockets which may remain undrained by earlier operations from the surface, and produce oil from them under control or plug them off before they can create a dangerous situation by discharging oil or gas into the underground workings. For this purpose a stuffing box packer has been devised which will hold securely against any pressures likely to be encountered in the locality. These packers, which are made with rubber sleeves collapsed to plug the annular spaces between the walls of the drill-holes and the small-diameter pipes inserted to draw off the oil, have demonstrated that they will control as much as 40 pounds of pressure per square inch; and engineers in charge of the work believe they will withstand very much greater pressures.

It is necessary to dwell at length upon these prospect or "feeder" holes, as it is thought that they represent a most important advance,—a step which, together with the new plan of driving galleries through dry shale bodies lying contiguous to oil-bearing sands, has made European oil mining methods adaptable to American conditions. Before their adoption, the miners worked in the muck and slime of dripping oil sands, with oil dripping down their necks and saturating their clothes; in an unhealthy atmosphere of mixed air and gas, where any spark was likely to cause an explosion; and where death stood always at elbow. In former times, if the miners penetrated unexpectedly into any undrained sand body, the underground galleries were filled with inrushing gas, oil, and sand, with death and disaster as a frequent result. About eight years ago, for example, two miners were drowned and buried in a gallery which was flooded with oil and filled with sand as a result of such a blow-out. Nowadays, if oil or gas is so encountered, its discharge is confined to a hole only two inches in diameter; and it can do little damage before being brought under control.

Miners Work in Safety

Under the present plan, the miners work in safety and comfort in dry and well-ventilated galleries cut out of suitable formations lying above, below, or between the bodies of oil-bearing sand.

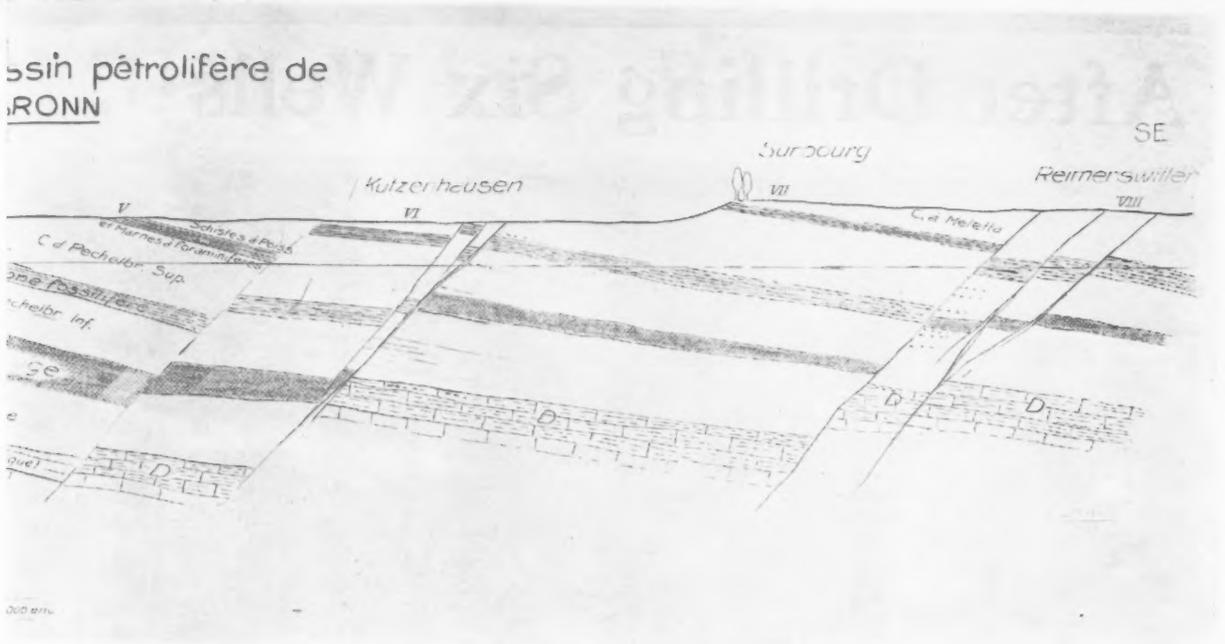
The development of the plan of gallery construction is graphically illustrated in Figure 1. In 1917, during the German regime, the galleries were driven directly through the sand bodies, as shown in the drawing on the left. Drippings of oil from the walls and roofs were collected in shallow ditches dug in the floors of the galleries. A practical advance was made in 1922, when the floors of galleries then in excavation were raised above the sable petrolifere, or oil-saturated sand; and deeper ditches were cut into this petroliferous formation for the collection of oil. The sable sec, or depleted sand, however, still formed the walls of the galleries.

The most important advance was made in 1925, when engineers commenced to drive their galleries in clay formations avoiding the sand bodies entirely. They then commenced to dig shallow sumps, reaching from the floor-levels down into the oil sands below. Nowadays, these sumps are no longer used for the production of oil, but only as catch-basins for the collection of oil produced from tiny shallow wells with pipe only three-tenths inches inside diameter. It might be said that some of the wells are inverted, since they are drilled upward, as well as downward, laterally, obliquely, in all directions and at all angles. Any number of such wells may drain into the same sump. In a typical situation, with the gallery lying midway between two oil-bearing sands, some of the wells are drilled downward and others upward. In cases where three or more productive sands exist in close proximity, a portion of the wells may be drilled entirely through one or more sands in order to reach other sands lying above or below. These production holes sometimes reach a depth or "length" of 120 meters (390 feet) in cases where they are drilled at an angle. In such instances, they have an initial diameter of 80 to 100 mm. (three to four inches) a final diameter of 50 mm. or two inches.

These tiny wells, which are customarily spaced at intervals of about 10 meters,—i. e., the points at which they tap the oil sands are usually about 32½ feet apart,—ordinarily flow naturally for awhile; and repressuring is resorted to at a later stage.

It is extremely interesting to note that the local application of pressure in what might be termed homeopathic doses has been productive of excellent results.

It cannot really be said that the average well "flows"; actually, it "drips." But "many mickles make a muckle," and the aggregate of thousands of such wells is the foun-



of Pechelbronn field, France

dation on which is based the success of a profitable enterprise.

Production is collected underground by means of pumps operated by compressed air; and is pumped to the surface by an ordinary working-barrel pump, with tubing and rods extending upward through a "well" or hole drilled from the surface to the level of operations underground for that special purpose. The surface installation at this well is not dissimilar from that of an ordinary pumping well.

Seventy Miles of Galleries

The Pechelbronn mines, of which there are three,—one called "Le Bel," another named "Daniel Meig," after a former president of the company, and another "Clemenceau," after the war-time premier,—might be likened unto an underground city, with subways, streets, pipe lines, and telephone systems. The galleries of the mines have an aggregate length of more than 70 miles; and the underground pipe-line system is as comprehensive as that of an average oil field. The workings are on many different levels of irregular depth, the maximum being about 910 feet from the surface. The galleries are not all on the same level, as they are traced in contact with the sand bodies, some following their direction and others their slope so as to form a net with rectangular meshes.

Each mine consists of two shafts, one for ingress and the other for egress of air. Compressed air is sent down through a five-inch pipe to supply the hammers, drills, pumps, and hoists, all of which are operated by compressed air. Air is sucked out of the ventilating shaft by vacuum pumps operating at the rate of 2500 cubic meters per minute.

The equipment used underground is illustrated in Figure 2. On the right is shown a Sullivan-type machine, manufactured by Alfred Wirth & Company, of Germany, which is used in drilling production holes. Spiral bits used in this service are shown in the foreground. The three air hammers on the left are used in excavating the galleries, as in any ordinary mining operation. The small manually-operated air drill on the right of these is used in drilling the five-meter prospect holes. The use of the reciprocating pump shown in the left foreground has already been described. The hoist placed immediately behind it is used in moving the small mine cars in which cuttings are removed to the central shaft and thence to the surface.

A number of mules are also kept underground for this service. Figure 3 shows the mouth of the shaft, with the cage in which these animals must have been lowered, although it seems difficult to believe that so large an animal could be accomodated in so small a space.

Safety First

In inspecting the underground workings at Pechelbronn, one is impressed at every turn with the thoroughness of measures which have been perfected to insure the safety of the workmen. The company is determined that the loss of human life shall no longer be regarded as merely incident to the character of its operations; and no stone is left unturned to guard against accidents and danger.

The air in every tunnel is regularly tested for gas content; the cubic contents of every gallery are computed; and signs are posted at each entrance showing the number of workmen who may be accomodated therein. The miners use lamps fed by batteries, as there is no electricity underground. Gas masks, first-aid kits, and fire-fighting equipment are maintained at strategic locations underground; and the workmen are drilled regularly in first-aid, fire-fighting, and safety work. Sand bags are also kept underground for use in walling off areas which may be affected by fire, flood, or gas. Heavy iron doors are also installed at suitable intervals, for the same purpose. Certain of these heavy doors are kept closed at all times, so as to guard against the spread of gas, fire, or flood. No smoking is permitted underground; and every workman who enters the shaft is searched for matches and cigarette lighters.

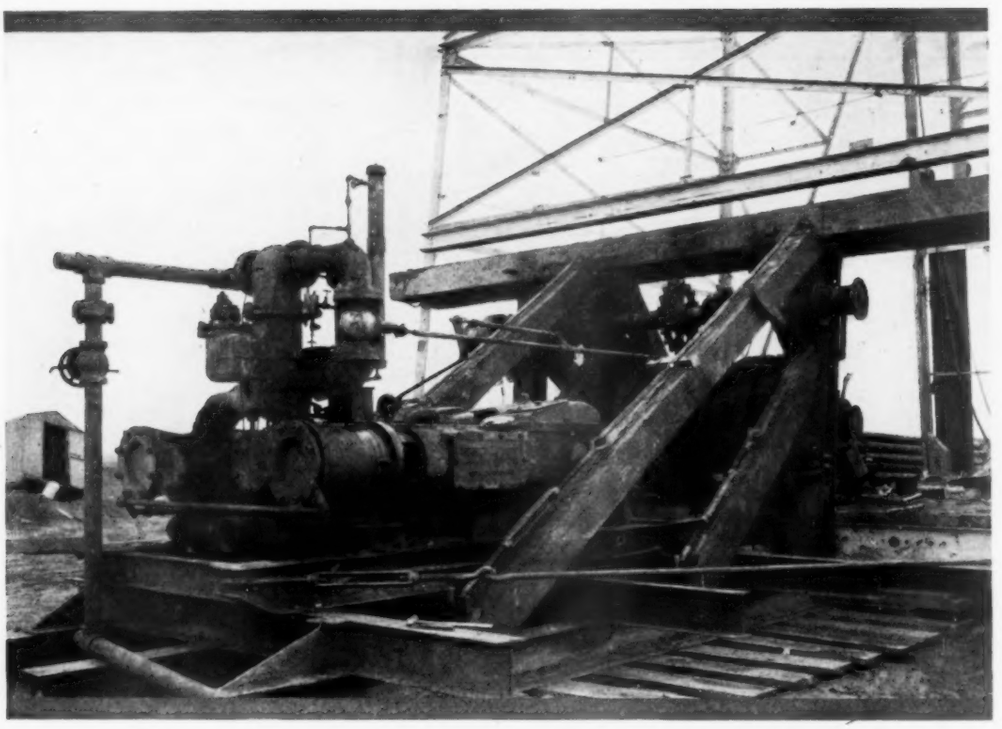
Officials of the company state that, in spite of the special risks which are run in connection with oil mining operations, the number of accidents at Pechelbronn has for the last 10 years been no greater than those in other French mines.

The shafts and galleries are of varying dimensions, corresponding to changes in management and policy which have occurred from time to time; but the present standard size for galleries is 2.1 meters wide at the floor, tapering to 1.1 meters wide at the roof, with a height of 1.9 meters or just high enough for the average man to stand erect.

Galleries are Timbered

The galleries are timbered, as in the ordinary mining operation, as shown in Figure 4. Lamps of the type used by the miners are shown suspended from the roof; and the casing of a "vertical" small-diameter well is shown drain-

After Drilling Six Wells . . . .



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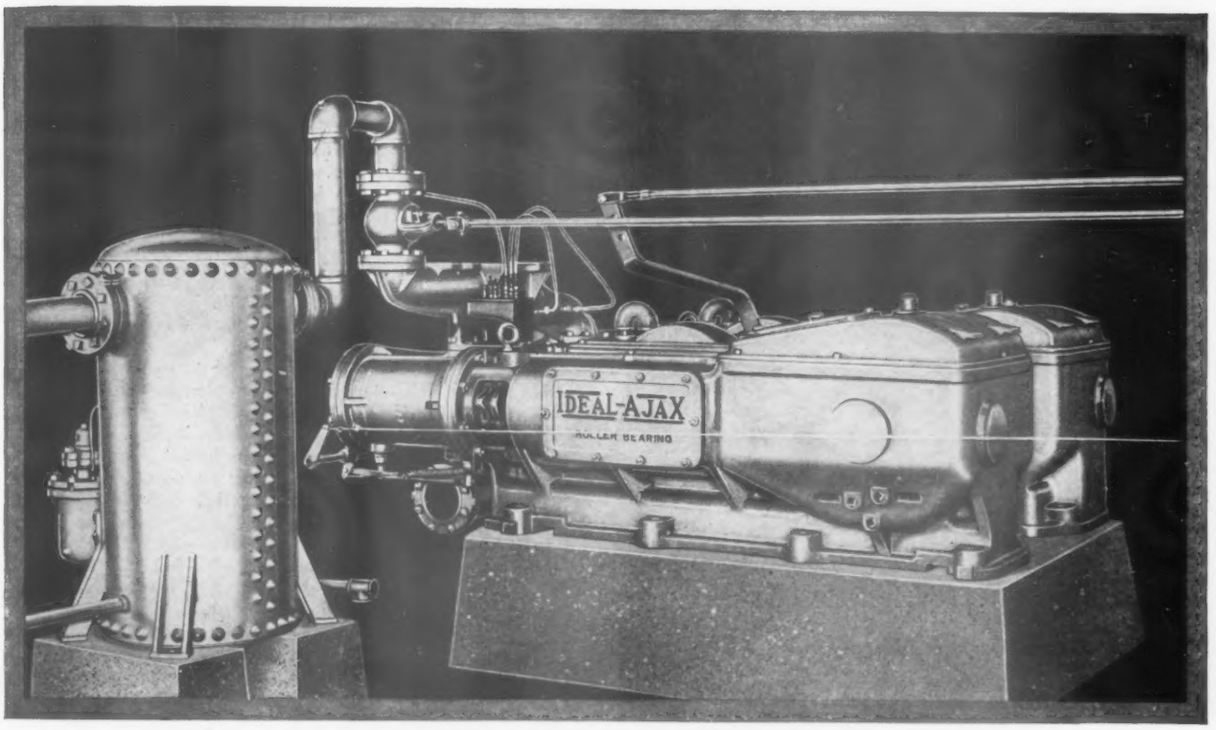

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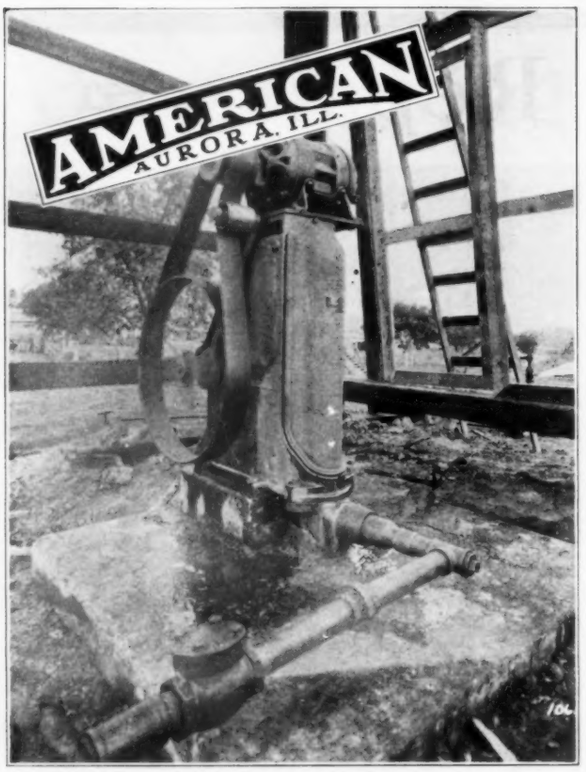

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Here is a 3150 foot well pumped by a No. 4-A "American" oil well pumping unit. Powered with a 5 H.P. motor, it's on the job twenty-four hours a day.

"American" pumping units are equipped for either belt or direct drive. The working parts are few in number and the accurately machined gears and pinions are oil immersed. All bearings, except two, are automatically lubricated. The machine is heavy, compact and well balanced; and gives a perfect straight lift to the polish rod. It is easy to install and easy to counterbalance. Special mulehead and cable sling protect the well in case of sanding.

"American" pumping units are furnished in six sizes with strokes from 12″ to 50″. All machines are available for immediate shipment.

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ing into a sump in the lower right-hand corner of the picture.

Work is conducted in four six-hour shifts. Routine mining work occupies three of these, and the fourth is devoted to repairs, reconstruction, and maintenance.

One of the most interesting features of the Pechelbronn operation is the manner in which new areas are surveyed to determine their possibilities in advance and to plan the location of galleries for their exploitation. The records of all old wells drilled and operated from the surface prior to the commencement of mining operations are recorded on a map. Where necessary, new wells are drilled for the special purpose of taking cores from the sands. Dry holes, mediocre wells, and prolific producers are indicated each by appropriate symbols; and areas abounding in dry holes or small wells are avoided, while those with a favorable production record are regarded as promising the greatest returns from mining. This, essentially, is the method employed, although other factors enter into such calculations such as: sand conditions, as revealed by coring or by logs of old wells; the extent to which producing sands have been drained by surface operations; the danger of bottom water; and other matters of geology.

The company states that the cost of oil recovered by this process has on the average from the outset been commensurate with that of oil extracted from borings. In considering this feature, however, American operators will remember that crude oil has a very much higher market value in France than in the United States; and that Pechelbronn is an old field where ordinary production costs, presumably, are higher than in the flush fields of other countries.

Records show that in the early days, when the sand was brought to the surface and washed with hot water, a yield of about 12 per cent or 120 kilograms per ton was obtained.

Underground Conditions

A tour of the shafts and galleries of the Pechelbronn oil mines afforded many revelations to one who has on hundreds of different occasions endeavored to visualize or reconstruct underground conditions from well-logs, corings, and other geological data.

There one sees shells, boulders, oil sands, water sands, depleted sands, dry sands, and other formations; faults, folds, lenses, and other geological features galore,—all right before one's eyes, so near that one can reach out and touch them and trace out their ramifications in detail.

The Pechelbronn field is in a highly faulted zone, and it was most interesting to trace out these fault planes underground. There are oil sands of all degrees of saturation, some still dripping oil and others as dry as powder, having been completely drained by earlier drilling and mining operations. There were sand lenses of many sizes, but all of the general shape of Viennese loaves. Some were only a few millimeters thick and only a few feet long; while others were hundreds of yards long and thicker than the diameter of the galleries penetrating them. Heretofore one may have been inclined to regard the phrase, "lenticularity of sands" as nothing more than a geological alibi; but here one could easily see how a well drilled from the surface could miss them entirely, penetrating only barren formations in the center of a proven oil field. In other places, there are as many as 10 different oil-bearing strata, lying one above the other.

Here were round boulders of only a few feet in diameter, which, if the bit should strike them squarely, might make a driller believe that he was in a solid rock formation.

Crooked Holes

Most interesting of all, however, was the finding of old wells penetrating the galleries underground. There were actual visual evidence of crooked holes. One well had a deviation of about 15 degrees from the vertical, and another with a divergence of about five degrees. The theory of crooked holes could have been discovered many years sooner, had anyone thought to look underground at Pechelbronn.

It would have been very instructive, time and facilities permitting, to have run a series of deviation tests,—using different methods,—at this particular point where results could be checked by actual measurement.

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Champion
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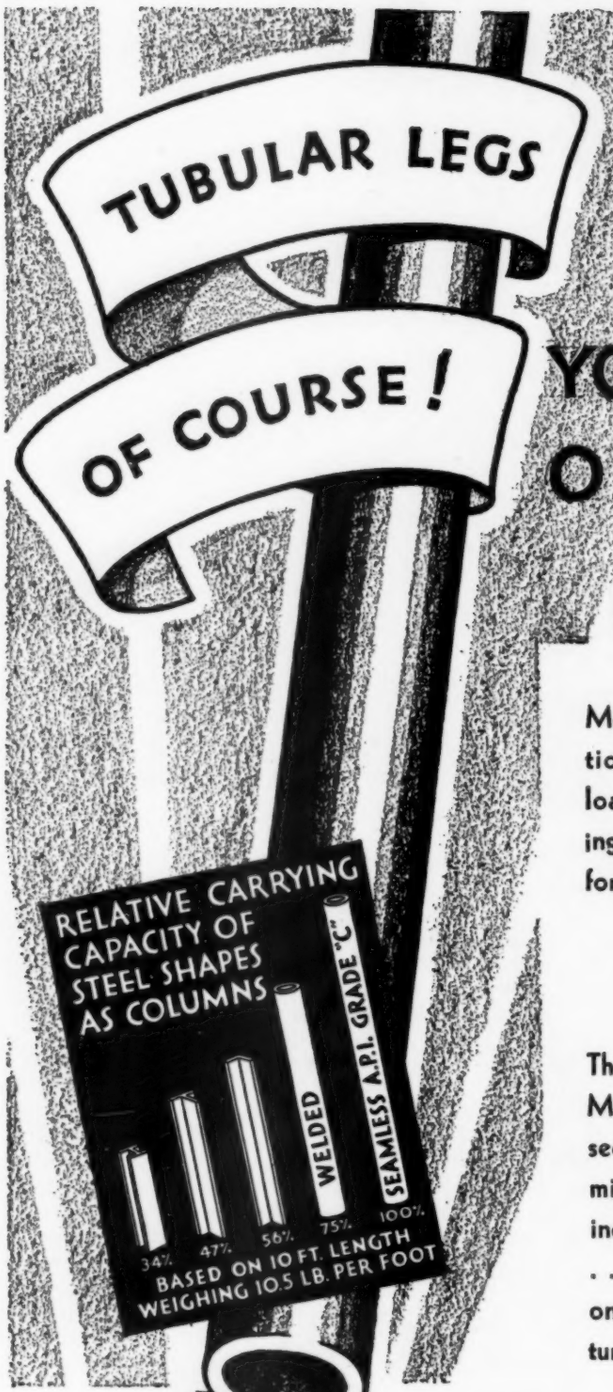

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The relative strength of the leg sections used in the Moore Champion Derrick is shown in the chart. These sections are of 40-50 carbon, seamless steel pipe. The minimum yield point is 45,000 pounds per square inch. This strength is preserved by hot-dip galvanizing . . . both inside and outside. You may safely depend on Moore Champion legs . . . and on the whole structure, which is built to utilize the exceptional leg strength.

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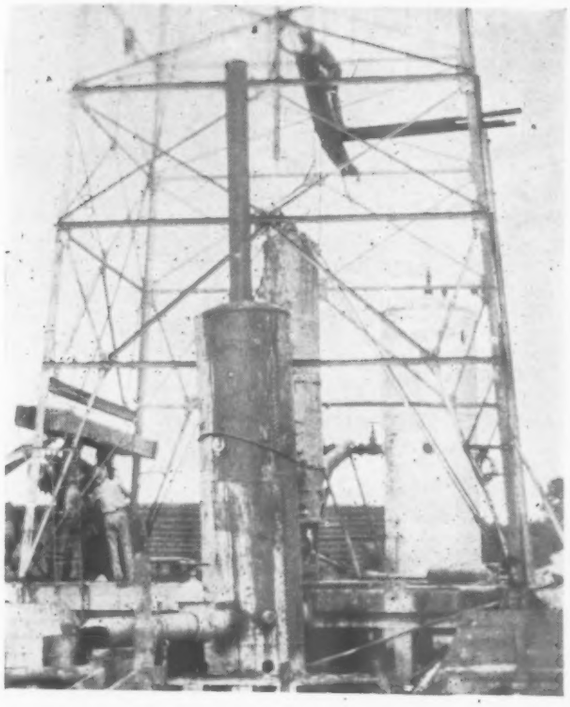
Oklahoma City Field

(*Continued from page* 68)



Bailing through top of separator on mud-separator method

of mud, gas, and oil usually attending the completion of a well. The first method utilizes a three by 15 separator which is fastened to the oil string by means of a heavy flange connection. This separator is connected to the usual number of flow traps and an extra small trap which receives the mud and cuttings, discharging mud at the bottom and gas through the top back to the traps. The well is bailed through the top of the separator and when pressure has been relieved sufficiently to permit the well to flow, a specially designed bull-plug is inserted in the top. The bottom gate is then opened and the well cleans itself into the separator.

The second method requires the running of an extra string of casing with perforations at the bottom and a bradenhead arrangement at the top. Clear water is pumped into the hole and the heavier mud and cuttings washed out. In order that method is successful, rock pressure must be greater than that exerted upon the sand by a column of clean water. So far as is known the rock pressure in wells completed in this manner has not been great enough to overcome the hydrostatic pressure, and they have required bailing before flow could be induced.

Casing and Cementing Practice

Depth and size of the surface string depend upon individual opinions and local conditions. In general 15½ inch O. D. 70 pound casing is set at an average depth of 200 to 300 feet and cemented with about 400 sacks. There are in effect three casing programs for the lower strings. The first program, which is the one generally followed, nine-inch, O. D. 40 pound casing is set as a water string and cemented with 2000 sacks; 6⅝-inch, O. D. 26 pound is set as an oil string and cemented with from 300 to 500 sacks, and 4¾ O. D. 16 pound as an emergency string cemented with about 100 sacks. The nine-inch has a wall thickness of .425, and the 6⅝-inch a wall thickness of .385, giving a total nominal clearance of .760. In the second program, nine-inch O. D. 40 pound casing is used as a water string; 6⅝-inch O. D. 24 pound is used as an oil string and 4¾-inch O. D. 16 pound as an emergency string. The total nominal clearance is the same as in program one.

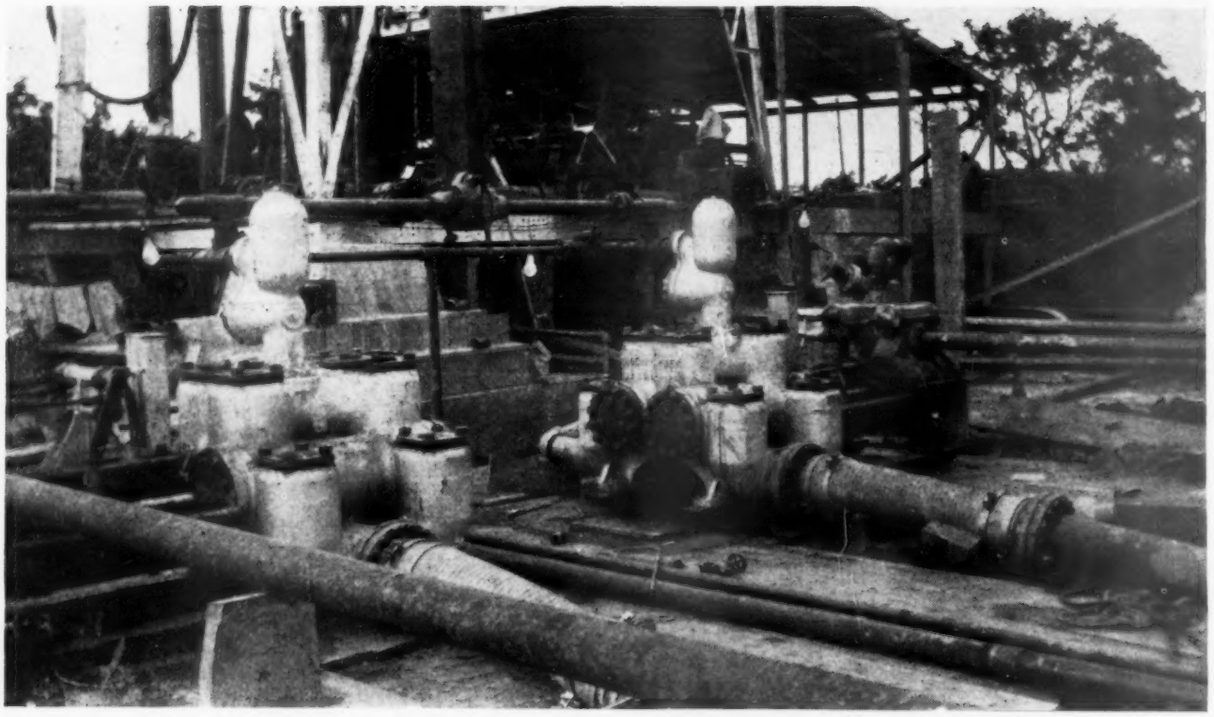
In the third program 9⅝-inch O. D. 40 pound is set as a water string; seven inch O. D. 24 pound is set as an oil string, and five-inch O. D. 15 pound used as an emergency string. Wall thickness of the 9⅝-inch is .391, that of the seven-inch is .332 giving a total nominal clearance of 1.186 inches as compared to .760 in the first program. All casing is of the seamless type and made of high grade steel.

Equipment

Three things are outstanding in regard to the rotary drilling equipment now used in the Oklahoma City pool. Weights have been appreciably increased on most of the major units, roller bearings have almost entirely displaced the old bronze type, and working pressures have been increased about 100 per cent. The type of equipment used in the Greater Seminole district was the heaviest in use at that time. The table below gives a comparison as to weights and radical changes in specification on a few of the more important units.

COMPARISON OF ROTARY DRILLING EQUIPMENT

	Oklahoma City Pool		Greater Seminole Area	
Item—	Specifications:	Weight:	Specifications:	Weight:
Bits, Rock	No radical changes			
Bits, Fish-Tail	No. used. Displaced by disc bits			
Boilers	125 horse-power, 350 pounds working pressure	37,000-43,000	BS H. P. 175 pounds working pres.	28,000
Blocks, Crown	6-Sheave, roller-bearing	4,500	5-Sheave, bronze bearing	4,200
Blocks, Traveling	76″ roller-bearing, 3¾″ center pin, 5-Sheave	9,000	66″, 4-sheave, roller-bearing	5,600
Chains	High grade alloy, heat treated steel.		Ordinary high grade steel	
Derricks	122′ to 175′ high			
Draw-works	7″ line shaft, 8″ breaks, steel jack-posts, manganese sheaves, roller-bearing	20,000	6″ line shaft, 7″ break, wood jack-posts, bronze bearings	15,000
Engines	No radical changes			
Hose	Variable, 8-ply in general use		9x11 Ply	
Pipe, Drill	25.2 Lb. per ft. heat treated steel		22 Lb. per ft. regular	
Pumps, Slush	14x7, 14½x7½, 16″ to 20″ stroke 1500 Lb. W. P. electric chrome-nickel steel water ends	12,000	12x6¾x16, 650 Lb. W. P.	8,100
Pumps, Boiler Feed	10x4-10		6x4x6	
Rope, Wire Drilling	1⅛″ Diam.		1″ and 1⅛″ Diam. about equally used	
Swivels	8″		6″ and 8″	
Fittings	Extra heavy malleable		Ordinary malleable	



Installation of slush pumps, showing rubber hose for absorbing shocks

Weights of equipment vary depending upon the particular design. Those given in the table are approximate but present a close comparison between the two areas.

Particular trouble has been experienced in designing a rotary hose which would withstand the high pressures and vibrations. Internal wire reinforcement and outside wrapping have been successful in only a small degree. Several operators are using an all-steel hose with ball bearing joints which permit the hose to swivel in any direction.

Aside from the standard rotary tools in general use, several wells are being drilled with Hydrill and Hild differential drive equipment. In the town-lot area, where a number of wells are being drilled on plots containing less than two acres, equipment must be so arranged as to utilize all available space. Some tests are being drilled with electric power which eliminates the use of boilers and saves considerable space.

Total cost of drilling and completing in the deep zones averages about $155,000 per well including lease equipment. At the end of June, 310 wells had been completed involving an expenditure of approximately $50,000,000. It appears from the drilling now in progress that, when the pool has been finally completed, expenses for the entire development campaign will have closely approached $200,000,000.

Production

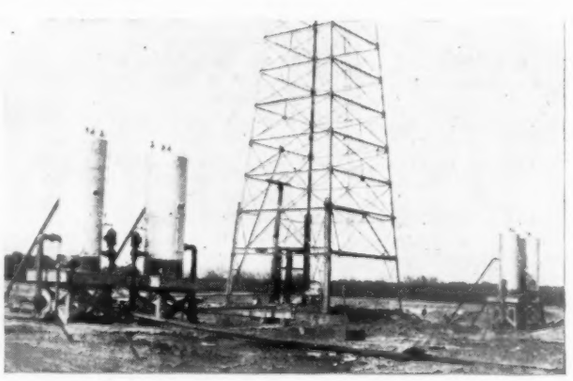
No other single structure has had as high an actual daily potential and produced as little oil as has the Oklahoma City pool. There is little doubt that with ordinary producing methods the field at one time might have produced more than 1,000,000 barrels daily.

All of the early wells were completed in the siliceous or Arbuckle limestone coming in with high rock pressures and initial volumes ranging from 5000 to 30,000 barrels daily. The discovery well commenced making water shortly after its completion and at this time all Arbuckle lime wells are producing water in varying amounts. At the end of June the average daily water output was approximately 12,000 barrels ranging from 11,000 to 18,000 barrels depending upon the class of wells opened under proration rules.

Although the initial production of sand wells is not as large as that of the lower horizon, only a few have made water and it is possible that their ultimate yield per unit area may be as high as that of the Arbuckle. Several wells in the south end of the pool have found water in the bottom of the Wilcox at about the minus 5425 contour.

Proration

The first proration agreement was put into effect on September 12, 1929, when operators agreed to a 100 per cent shut-down. This continued until October 12 with an additional day on October 27. From November 1 to December 2, wells were divided into four classes, A. B. C and D. and allowed to produce 60 per cent of the time on a monthly basis. From that date until January 21, 1930, the same plan was followed with the producing time reduced to 50 per cent and during the period January 21 to February 26 the time was further reduced to 25 per cent. On the latter date four additional classes were added and a 12-day cycle replaced the monthly basis. Under this agreement the wells were allowed to produce 12½ per cent of the time and the agreement was in effect until March 22 when the percentage was increased to 16 2/3 per cent, making an allowable production of two days out of each 12-day cycle. On June 26 the time limitation was fixed at 8 1/3 per cent.



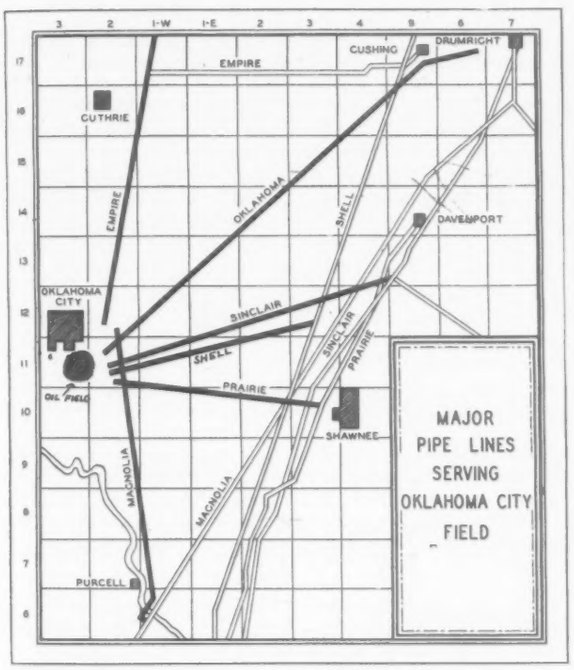
Installation of four separators at one well

Special provisions have been made for prorating wells on gas lift permitting them to produce six consecutive days and taking the highest production any one day as the potential. This figure is multiplied by six and that amount of production charged to the well. Wells of this class are then required to shut in for a period of time corresponding to that in operation on other classes. With this exception, all proration agreements have been based on a time element rather than on the daily potential plan as used in other Oklahoma fields.

Pipe-Line Connections

The field is served by the lines of six companies as shown below:

Name of Company—	Station	Size of Line	Type	Length
Empire Pipe Line Co.—	Cimarron	Eight-Inch	Welded	32 Miles
Magnolia Pipe Line Co.—	Gray	Eight-Inch	Welded	26 Miles
Oklahoma Pipe Line Co.—	Cushing	Eight-Inch	Welded	52 Miles
Prairie Pipe Line Co.—	Shawnee	Two Eight-Inch	Welded	30 Miles
Shell Pipe Line Co.—	Ray	Six-Inch	Welded	30 Miles
Sinclair Pipe Line Co.—	Payson	Two 10-Inch	Welded	35 Miles



Natural Gas Gasoline

Eleven gasoline plants are now in operation and three are under construction. Total daily capacity of the plants in operation is 495,000 cubic feet with a total gas input of 315,000 cubic feet daily. Recovery per 1000 cubic feet ranges from .46 gallon to one gallon the average being about .586 gallon per 1000 cubic feet. Twelve of the plants use the absorption method, one is a combination absorption-compression, and the other is a compression plant. A large per cent of the residue gas is sold for commercial consumption, used as fuel, or for flowing wells by gas lift.

Operators have been confronted with a multiplicity of problems seldom, if ever before, encountered. Individual ideas of drilling superintendents and company engineers, have been utilized for the common good of all of those concerned and with an apparent absence of any petty jealousy. Much has been done toward efficiency in drilling and completing wells but the outstanding accomplishment is the application of a rigid proration scheme which has been successful only because of the co-operative attitude of the companies. Production has been held to a maximum of less than 150,000 barrels daily and the average daily output has been much below this figure. When it is considered that the Oklahoma City pool could have produced well above 750,000 barrels daily at one time, and during a period when the market was exceptionally weak, the success of proration efforts can be more readily realized.

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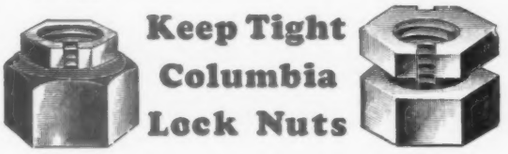
Equipment that JARS—BUMPS or VIBRATES,
Unless it is bolted together with

Hexagon — Hexagon



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Proration Success Outstanding During Past Year

By FLOYD SWINDELL
Staff Representative

TULSA.—Although Oklahoma City development has overshadowed all other fields in Oklahoma in the first half of 1930, the Sooner state nevertheless has contributed substantial production in pools, which under reversed conditions would have held the limelight. Konawa, Asher-Wannette and eWst Chandler are today fields of recognized importance, while Orlando gives promise of contributing substantial production.

Proration should be given a ranking place in any consideration of Oklahoma. From an economic viewpoint, it has played a role far greater than the development of any oil field. The effort to curtail production is several years old in Oklahoma. Efforts in this direction began shortly after Seminole became a source of burdensome production in 1927. One proration effort followed another, with varying success. Finally when Oklahoma City came to the forefront, proration was forced on the whole state, as pipe line systems declined to take additional crude oil.

Proration reached its most drastic status July 15, when by agreement the output for Oklahoma was fixed at 550,000 barrels daily. This alowabe output was fixed against an estimated potential production of 1,400,000 barrels.

The fixed output will remain 550,000 barrels until September 1. But indications are that either this figure or one but little changed will remain for the rest of the year.

Production at Oklahoma City has been estimated as 600,000 barrels daily, more than that allowed for the whole state. Against such a potential, output from Oklahoma City will, until September 1, be held to 86,500 barrels daily. What Oklahoma City might have produced without restrictions must remain a subject for discussion. Certainly it would have surpassed any other field the Mid-Continent has ever known and it seems equally as certain that it would have surpassed anything the petroleum world has ever known.

This potential production has been established through one of the most consistent drilling campaigns in the history of petroleum. Oklahoma City has today more than 300 wells completed, with 357 in various stages of development. It is common opinion now that the development program stands at the half-way mark. There will be other wells started to swell the total of those now under development but it is also possible that some of the wells now listed from location to drilling will not be finished.

To fix the development at the half-way mark, is a hazardous guess, since the limits of the field are not defined on all sides. Against those who estimated that Oklahoma City will, when finally drilled have 650 wells, there are others, who set the final figure at 1000 wells.

Cost May Total $155,000,000

Whatever the number of wells, their cost will set a high mark for Mid-Continent field development. The average cost has been given repeatedly as $155,000. Should 1000 wells finally be drilled, the development cost will reach $155,000,000.

While the area known as Greater Seminole was on the downgrade from a development point in the first half of 1930, it is significant that these pools had potential output of 305,000 barrels daily, July 15. Proration, however, gives them but 152,000 daily output. East Earlsboro and South Earlsboro, which properly belong to Greater Seminole, had potential of 94,000 barrels against allowable output of 25,900 barrels. Thus the Greater Seminole area, which has been lost in oil estimates of Oklahoma, still ranks as a section capable of producing close to 400,000 barrels daily.

Konawa has had the greater part of its development in the first half of 1930. Its potential output is listed as 100,000 barrels by the proration committee of Mid-Continent Oil & Gas Association. Recent drilling has given a few instances of defining production limits, but the extent of the producing area must be finally determined in the last half of the year.

Asher-Wannett Important

Asher-Wannette has come into Oklahoma petroleum circles this year and will reach its high point during the last half of the year. It is given 20,000 barrels potential output at present, although wells now drilling are certain to raise this figure weekly. This area was uncovered when an effort to get Wilcox sand production failed. A ripped casing, where an oil showing during drilling, had been indicated, resulted in an 800 barrel well from a sand, which has not yet been identified. There are now 10 completed wells, with 29 drilling.

West Chandler, Lincoln County, has production in both Wilcox and Simpson formations. Drilling agreements have resulted in wells being drilled on 40-acre blocks so far. The extent of the field and its possibilities for production are yet to be determined but it will be one of the fields of consistent development for the remainder of the year.

The Orlando area has given just sufficient production to give every indication of the existence of a major oil pool. The development there is being carried along through unit development. This will assure orderly drilling, with consistent development, following whatever success early wells have.

The Orlando area is being tested for Wilcox sand production. So far other formations have yielded all oil but the primary object still remains the Wilcox sand.

Western Oklahoma is now the area to which attention is being turned from a leasing standpoint. So far only geological surveys and leasing have been attempted. Core drilling has resulted in the formation of many acreage blocks of immense size. It would seem that economic conditions will hold back the testing of these blocks. But there is every reason to believe that the end of the year will find the western half of the state sufficiently leased to satisfy the major companies. After that testing will start when it is possible to find a market for oil.

Lack of Market Holds Down Development in Kansas

By FLOYD SWINDELL
Staff Representative

WICHITA, Kansas—Outstanding development in Kansas for the first half of 1930 were the rise of the Voshell pool in McPherson County, the discovery of the Schurr pool in Rice County and the natural gas drilling campaign in Morton and Stevens Counties. While these hold the forefront because of results, of but little less consequence was the active leasing campaign for the western half of the state and the few wildcat completions, which have not had sufficient additional development to give an estimate of their significance.

Kansas, like other sections of the Mid-Continent, has been forced to battle against a top-heavy crude oil reserve. This has kept the Voshell pool down to less than half its possible production of 50,000 barrels daily. The Schurr pool is now without any outlet and no indication that it will have one.

Drilling for gas in western Kansas, however, has had no

(Continued on page 278)

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When the oil industry began to shape destiny in the Southwest there was the handicap of inadequate financing facilities. Oil financing was difficult to obtain in the old and established banking houses. So the Exchange National Bank of Tulsa was organized, to assist in and encourage development of an infant industry by making oil financing available. As a result the Exchange National has always been recognized as the Oil Bank of America.

During the life of the Exchange National Bank the bit has discovered and developed more than a score of flush fields in Mid-Continent territory. Many of these fields made history in the industry. All of them commanded national attention. And although this bank cannot move about like the "big plays" in oil, regardless of shifting activity the Exchange National remains dominant, unchallenged . . . the banking instution through which flow major business transactions in all branches of the oil industry.

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CREDIT SENTRY OF THE OIL FIELDS

Numerous Geophysical Prospects Prove Disappointments

Phenomenal success which marked development of early Gulf Coast discoveries is absent in testing of newer prospective salt domes

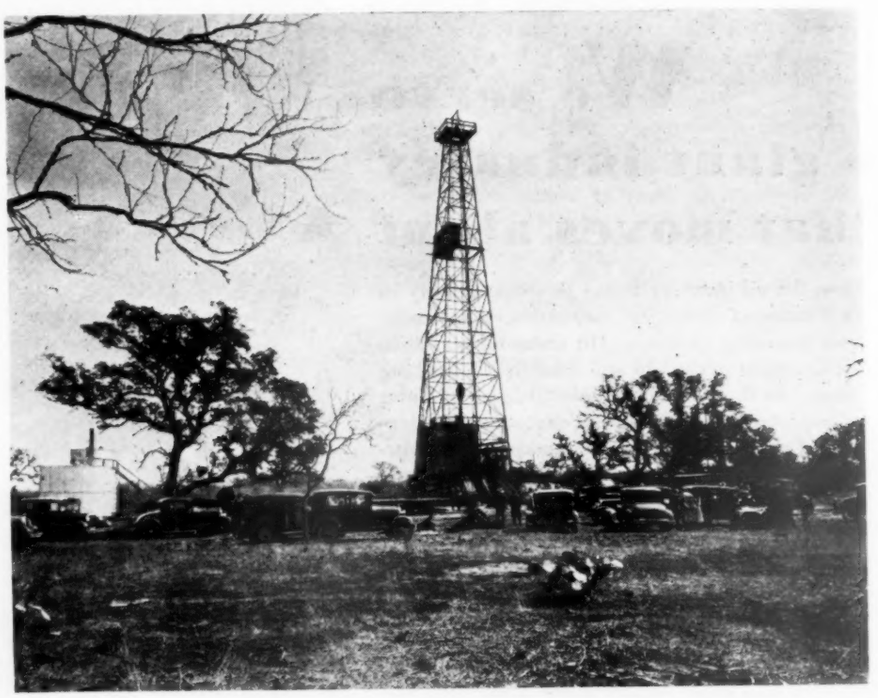
By JACK LOGAN
Staff Representative

WHILE the activity centering around Refugio and Pettus has tended during the past half-year to divert attention in the Gulf Coast from the regular salt dome territory to the structural country farther southwest, as pointed out in a separate article in this issue, work has continued steadily, nevertheless, in the salt dome fields, and although the usual careful, unhurried field development has prevailed for the most part, there have been various noteworthy accomplishments, including the establishment of new deep production and deep drilling records, opening of production in several new fields, finding of new sands in old fields, and continued work with geophysical instruments resulting in location of a few additional prospective domes and structures.

New salt dome fields opened since the first of the year include Moss Bluff, Liberty County, on the Texas Gulf Coast, and Caillou Island, Terrebonne Parish, along the Louisiana coast. The discovery well at Moss Bluff was Humble Oil & Refining Company's Sterling 6 on the southeast flank of the dome in the James McFadden Survey. It came in early in January, 1930, flowing 800 barrels of 36 gravity oil daily from total depth of 5666 feet. Although this well supplied the first oil in the field the existence of a salt dome has been proven through a shallow test shortly after its discovery by seismograph in 1926. The second oil well was completed at Moss Bluff on July 8, 1930, when Gulf Production Company's McFadden 1-A, located 650 feet northwest of the discovery well, came in flowing 1000 barrels of 29 gravity oil daily at 5831 feet. Production was established on the Caillou Island dome, Terrebonne Parish, through the second test drilled there following its discovery by seismograph, The Texas Company's Caillou Island 2 coming in January 24, 1930, flowing 1100 barrels of 28 gravity pipe line oil daily at the depth of 3239 feet. The well flowed for several weeks, after which it quit producing, later being abandoned. Bay Junop, another dome in Terrebonne Parish, furnished its first oil test completion in February, 1930, when a well put down by the Texas Company hit cap rock at 5100 feet after failing to develop production from an oil sand encountered a short distance above cap rock.

During the first half of 1930 the first drilling was done on numerous geophysical prospects in both the Texas and the Louisiana divisions of the Gulf Coast. These prospects are listed in an accompanying table along with pertinent facts connected with them. Most of them are recent dis-

(Continued on page 276)



THE outstanding development in South and Southwest Texas during the first six months of 1930 has been the shifting of interests from the salt dome fields and their prospects to the structural and faulted country lying along the lower Texas Gulf Coast, south and west of the regular salt dome fields.

In this shifting of interest, the developments at Pettus furnishes the outstanding evidence of the new interest in the trans-salt dome country, although the spark which started the fire of enthusiasm originated at Refugio, which for years, and up to 1928 had been neglected on the assumption that it was but another of the gas areas so common in South Texas.

A special article dealing with this interesting development centering around Pettus, prepared by Jack Logan, staff representative of THE OIL WEEKLY, will appear in a coming issue.

Geophysical Prospects First Drilled in 1930

(Including those on which first well started earlier but was not finished until 1930.)

These areas are mostly recent discoveries, made with both seismograph and torsion balance, or both. This table demonstrates that development on these new prospects, interpreted in many instances as deep domes or other unfamiliar structures, is not attended with the phenomenal success marking early drilling on older geophysical discoveries consisting largely of shallow domes. On some of the later the first well yielded oil, and in numerous cases the first test encountered cap rock or salt.

LOUISIANA GULF COAST

Area	Sec., Township, Range	Company developing. Results.
ACADIA PARISH		
Iota	10-8s-1w	Calcasieu Oil Company—Abandoned 6600-foot test.
CAMERON PARISH		
Mallard Bay	32-12s-3w	Shell Petroleum Corporation—Junked test at 7229 feet.
Cameron Meadows	21-14s-13w	Vacuum Oil Company—Good prospect, made over dozen drill stem tests in first well, which has pipe stuck at 3950 feet total depth; 3750 foot sand yielded good sample 26 gravity oil.
JEFFERSON PARISH		
Lafitte	2-16s-23e	Humble Oil & Refining Company—Drilling below 2000 feet in first test.
JEFFERSON DAVIS PARISH		
South Welsh	1-10s-5w	Pure Oil Company—No sand tested in 5200-foot well.
LAFAYETTE PARISH		
Carenco	33-8s-4e	Pure Oil Company—Drilling 4500 feet, first test.
LA FOURCHE PARISH		
Wisner	19-23s-23e	Gulf Refining Company—No shows in 6400-foot well.
Leeville	27-21s-22e	The Texas Company—Drilling first well, oil shows 5250-75 feet.
PLAQUEMINES PARISH		
Lake Grande Ecaille	20s-26e	Humble Oil & Refining Company—One test hit salt, one had show heavy oil at 5150 feet, another drilling.
ST. LANDRY PARISH		
Eunice	14-6s-2e	Elbof Exploration Company—Quit 4350 foot test, no shows.
ST. MARY PARISH		
Patterson	21-17s-11e	Vacuum-Empire—Nothing tested in 6350-foot well.
Glenwild	Lot 20-15s-12e	Louisiana Land & Exploration Company—Quit 5700-foot test, no sands tested.
Wax Lake	11-7s-9e	Pure Oil Company—Abandoned well at 5700 feet, no sands tested.
Avoca	35-16s-12e	Louisiana Land & Exploration Company—First test started.
Charenton	41-14s-10e	The Texas Company—Drilling below 6000 feet, no important shows.
TERREBONNE PARISH		
Bay Junop	8-21s-14e	Oil shows around 4800 feet, cap rock at 5100 feet.
Four League Bay	12-21s-12e	No important shows in 6000-foot test.

TEXAS GULF COAST

Area	Survey	Company Developing; Results
BRAZORIA COUNTY		
Manvel	H. N. Little	The Texas Company—Tested salt water 5511 feet; going deeper.
Austin Bayou	Henry Austin	Rycade-Amerada—First well drilling below 5700 feet, no shows.
CALHOUN COUNTY		
Chocolate Creek	J. P. Tilley	The Texas Company—First test drilling below 2000 feet.
CHAMBERS COUNTY		
Cove	Chas. Tilton	Pure Oil Company—Drilling below 6600 feet; no important showings.
Oyster Bayou	Robt. Oliver	Pure-Rycade—Drilling 4000 feet, no shows.
Salt Cedars	T. & N. O. Sec. 17	The Texas Company—Drilling below 3000 feet.
FORT BEND COUNTY		
Clodine	Jno. Frederick	Gulf Production Company—First well abandoned 6065 feet; second 4600 feet; nothing important found.
Pilant Lake	Wm. Barrett-A. Harris	Pure Oil Company—Only test abandoned 4500 feet; no shows.
GRIMES COUNTY		
Yarbero	J. J. Whiteside	Cranfill-Reynolds Company—First test had several oil shows, abandoned 4600 feet; second drilling.
HARRIS COUNTY		
Eureka	John Flowers	Buffalo Oil Company—Abandoned 4650 feet test.
Cedar Bayou	Hannah Nash	Sloane Prospecting Company—First test had several oil and gas shows from 4500 to 6000 feet, abandoned 6200 feet; second abandoned 6400 feet.
Deer Park	E. Brinson	Strang Petroleum Corporation—Abandoned 6125-foot test, no important shows.
Ogburn	J. C. Ogburn	Cranfill-Reynolds Company—Three oil shows from 2200 to 3000 feet in 5420 foot test.
JACKSON COUNTY		
Lolita	G. Ewing	The Texas Company—Drilling below 5700 feet.
LIBERTY COUNTY		
Devers	M. Whittington	Humble Oil & Refining Company—Drilling below 5800 feet, no promising shows.
MATAGORDA COUNTY		
Wheelwright	G. Wheelwright	Watts Oil Company—Had gas show at 450 feet but abandoned test at 3500 feet.
VICTORIA COUNTY		
Bloomington	M. Traviesa	Lion Oil Refining Company—Completed 35,000,000-foot dry gas well at 3749 feet.

Field Development Is Orderly In West Texas During Past Year

By H. H. KING
Staff Representative

SAN ANGELO, Texas.—Having failed to come through with its usual quota of wildcat oil and gas strikes, West Texas experienced an orderly development program during the past 12 months that was largely confined to areas uncovered more than a year ago. Only six oil strikes were made by wildcatters in the district during the year just ending that can be classed as bonified discovery wells, although a number of additional strikes were made that are isolated from established pools or fields, but are likely to be proven more of an extension well proposition. Two new counties were added to the group on steady production, which now averages about 300,000 barrels daily, as result of new discoveries.

Andrews County joined the lost of producing counties in West Texas through the successful completion of Deek Rock Oil Company-The California Company and Atlantic Oil Producing Company's Ogden 1 in lime at 4345-4428 feet. This discovery well made 200 barrels initial on natural flow in December, 1929, and is probably the most important strike for the year, although recent development to the south and east has been disappointing. A south offset to the discovery well has been completed with an estimated production of 400 barrels daily, but is not being operated for lack of a crude market outlet. This area offers crude of a high sulphur content, and may be slowed down in development by lack of popular demand with pipe line companies.

Wildcat efforts of J. B. Dunigan-Fred Hyer and associates on the French-Hunter land, Taylor County, enabled the county to join the ranks of those on production in the district in October, 1929, with an initial output of 150 barrels of 40 gravity oil daily from sandy-lime at 2389-91 feet. Successful oil completions in this area have been increased to four, but no market is available for the oil, and is not likely to be created until sufficient production is obtained to justify the erection of a small refinery.

Approximately 250 wildcat failures were completed in the district during the past 12 months, thus giving the operators a small percentage of successful oil and gas strikes for the amount of activity carried on in their search for new horizons. This toll of wildcat failures was materially enhanced by persistent efforts made to uncover shallow production in northeastern Pecos County, centering on Blocks 8, 9, 10, 11 and 12, H. & G. N. Ry. Surveys. The play had its beginning when Rowan-Tong, Inc. and Independent Oil & Gas Company's J. A. McDonald 1 flowed 90 barrels oil per hour from lime at 1605-12 feet late in August, 1929. This well proved to be a freak producer, and the heavy flow of oil and gas soon exhausted, while deeper drilling failed to revive the production. Oil companies and operators expended approximately $5,000,000 for lease and royalty protection and on development work in this general section of the country on the strength of the spectacular performance of the McDonald well, while The Texas Pipe Line Company built a 12-mile six-inch coupled line from McCamey station to the well and never filled the line with oil.

Open New Pecos Area

Cranfill-Reynolds Company, Inc. et al opened a new shallow oil area in northwestern Pecos County on the J. Masterson ranch in December, 1929, making 40 barrels oil daily at 1249-70 feet, with a total depth of 1495 feet. This strike has also proven freakish, as only one of a group of nearby tests succeeded in making a pumper.

Ector County got off for a good start as an important source of crude after the completion of Humble Oil & Refining Company-Penn Oil Company and Atlantic Oil Producing Company's Kloh 1-D as a 380-barrel flowing well in lime at 3715-44 feet early in October, 1929. This well really extended the Connell, or Judkins field to the northeast, about three miles, and the two areas have since been practically linked together with production. First production on the Connell ranch was uncovered in December, 1926, with a 40-barrel pumper, by J. S. Cosden, Inc., and later one-half interest in the block was purchased by The Texas Company. The performance of Kloh 1-D started field work on leases lying between the original pool and the outpost well early in 1930, and production of the field is now averaging about 20,000 barrels daily. This field is the only one in the district that has registered an important increase in production during the past six months, and it is to be prorated beginning August 1 to about 50 per cent of its potential capacity. Indications are that the Judkins field has been virtually defined.

Ward Adds Two Areas

Ward County continues to figure prominently as a potential crude source, and during the past 12 months added two new oil areas. Production was carried to the townsite of Grand Falls in October, 1929, when Alpine Oil & Development Company's Boogher 1 made 25 barrels natural from sandy-lime at 2120-50 feet. This well was later deepened to 2508 feet without increasing its oil yield. Development work has been confined to small operators, and all completions have been of small caliber. Joint activities of Penn Oil Company and Atlantic Oil Producing Company on the J. B. Bennett ranch established a new field for Ward County about six miles northwest of the Shipley field in September, 1929. This wildcat made 140 barrels natural at 2348-2572 feet, with a total depth of 2621 feet, and continues to produce at its initial rate in flowing through tapered tubing. Only one additional test has been added to the area, and it proved to be a smaller well. Shell Petroleum Corporation's Sloan et al 1 established a lower oil horizon for the Shipley field last May after failing to produce in the regular 2500-foot horizon. This well was carried to 4415 feet, and when plugged back to 3056 feet and shot twice between 2880 and 3040 feet it pumped 50 barrels daily.

Roeser-Pendleton, Inc. and Amerada Petroleum Corporation's A. T. Haught 1-A established a new oil area in northeastern Fisher County in August, 1930, making 135 barrels initial from sandy-lime at 3120-3127 feet. A pipe line connection was obtained, but the crude market outlet is limited, and little effort has been made to proceed with development of this new pool.

Tabulation of all discovery wells in West Texas is carried in this issue, with the current production of each well included. Many of the older pioneer wells are proving to be consistent producers, as illustrated by the fact that the first commercial oil well in the district continues to pump about 16 barrels daily, although deepened from the original oil horizon. Mitchell County contributed this original producer as result

of the wildcat efforts of Underwriters Producers & Refiners Company in October, 1920. The California Company later acquired the well and acreage, and deepened the hole from 2498 to 3050 feet. Oil production had been found in the district prior to this strike, but not in staying and commercial quantities. The discovery well of the Big Lake field continues to pump 12 barrels oil daily after being on production since May 28, 1923. It is of special interest since the West Texas Permian Basin was not recognized as an important potential crude supply until the establishment of the Big Lake field as a flush area by Big Lake Oil Company.

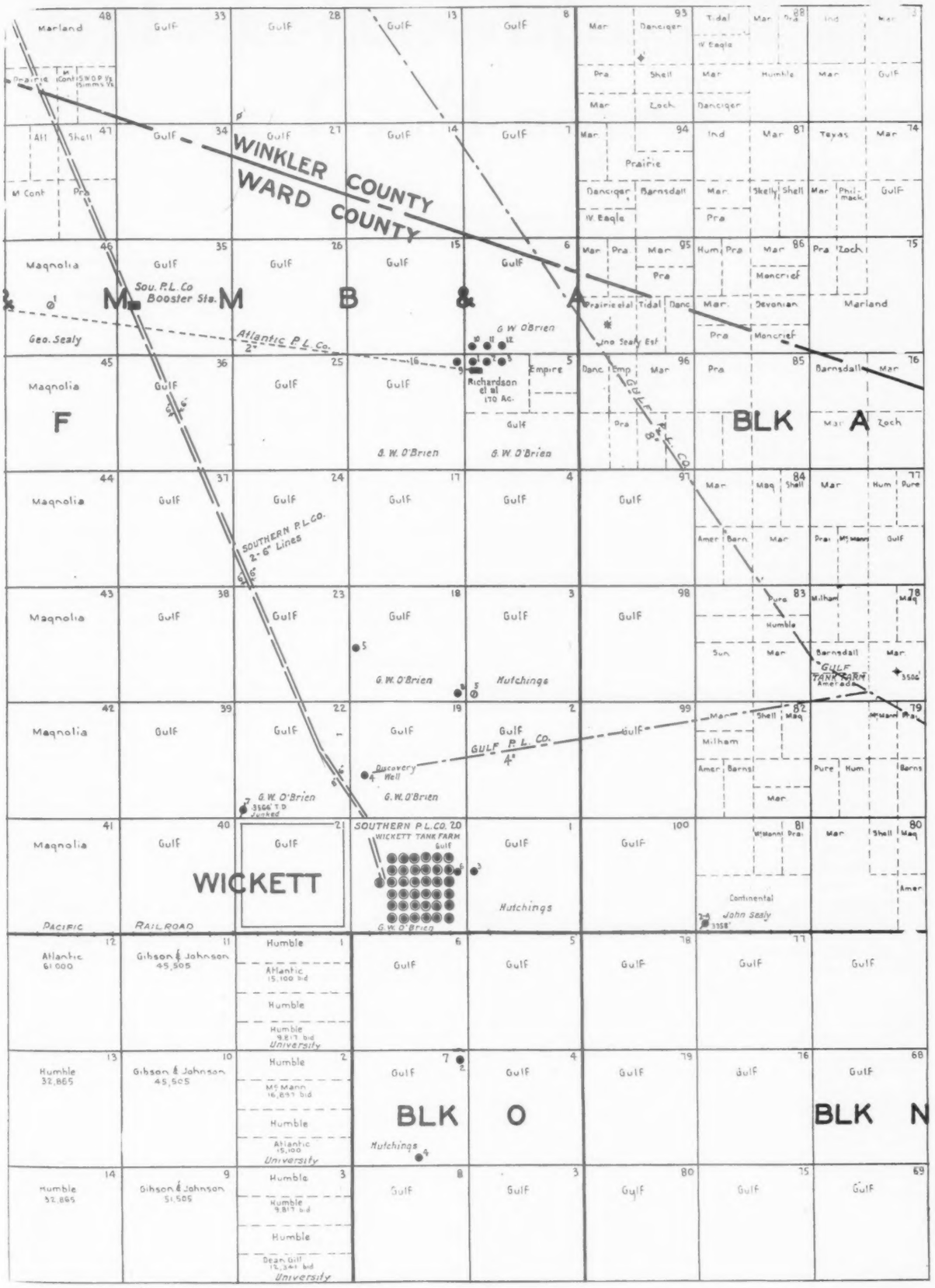
WEST TEXAS DISCOVERY WELLS

Discoverer and Lease Name—	Elev.	Top Salt	Top Lime	Prod. Horizon	Total Depth	Date Comp.	Initial Prod.	Present Prod.	Oil Grav.
ANDREWS COUNTY									
Deep Rock Oil Co., Atlantic, California Company's C. E. Ogden 1....	3206	1750	4050	4345-4428	4428	12-18-29	200	100	28-29
CONCHO COUNTY									
Arkansas Fuel Oil Co.'s S. A. Hargrove 1.....	1667	....	....	1110-1140	3236	5-20-27	1 Mil. gas		Shut in
CRANE COUNTY									
Taylor-Hughes Fie'd									
Independent-Turman-Maxwell (now Independent O. & G. Co.'s 1) Len Taylor-Sapp 1	2474	450	2030	2038-2045	2045	2-24-26	140	10	28-30
Church-Fields Field									
Church-Fields et al, (now Magnolia Pet. Co. et al's) University 1...	2601	1145	2925	3038-3040	3040	4-19-26	190	8	30-32
Gulf-McElroy Field									
Gulf Production Company's J. T. McElroy 1.....	2502	1000	2661	2728-2833	2833	7-21-26	600	180	30-32
Gulf-Waddell Field									
Gulf Production Company's W. N. Waddell 2.....	2744	1170	3068	3194-3500	3519	8- 4-27	30	10	31-32
CROCKETT COUNTY									
World-Powell Field									
World Oil Company's (now Humble O. & R. Co. & Continental Oil Co.) L. P. Powell 1.....	2809	1173	2572	2644-2647	2647	6- 8-25	25	15	28-30
Todd-Cooke Pool									
J. C. Cooke et al. (now The Texas Co.'s) J. S. Todd 1.....	2672	1038	....	1695-1705	2102	4-24-26	1 Mil. gas		Shut in
Donnelly-Shannon Pool									
W. W. Donnelly et al's J. M. Shannon 1.....	2486	....	....	1664-1680	1759	10-16-27	10 Mil. gas		Shut in
ECTOR COUNTY									
Judkins Field									
J. S. Cosden, Inc. (now The Texas Co. and Cosden Oil Co.), W. E. Connell 1-A.....	2847	875	3170	3465-3482	4002	12-28-26	40	SD	35-36
Humble-Penn & Atlantic's Kloh 1-D.....	2925	1230	3410	3715-3744	3744	10-11-29	380	100	35-36
FISHER COUNTY									
Royston Field									
The Texas Co.'s Dan W. Stephens 1-A.....	1937	....	3190	3238-3275	3275	1-17-28	280	40	38-39
Roeser-Pendleton-Amerada's A. T. Haught 1-A.....	1803	....	3080	3120-3127	3127	8-14-29	135	60	36-37
GARZA COUNTY									
				1970-2002					
B. V. Blackwell et al. (now Emerald Oil Co.'s) J. M. Boren 1.....	2358	470	1625	2417-2449	2600	5- -26	5	SD	37-38
GLASSCOCK COUNTY									
Marland & Texon (now Continental Oil Co.—Group No. 1 Oil Corporation's) W. R. Settles 1.....	2646	....	2030	1235-1298	3504	3- 8-27	200	135	32-33
World-McDowell Field									
World Oil Co.'s L. S. McDowell 1-C.....	2530	....	2260	2351-2398	2440	4-28-29	250	40	27-28
HOWARD COUNTY									
Chalk Field									
Owen-Sloan et al. (now Magnolia Pet. Co.'s) Otis Chalk 1-A.....	2430	....	....	1578-1583	1586	4-18-26	70	7	31-32
Clay-Hyer Field									
				1542-1562					
Fred Hyer et al. (now Continental Oil Co.'s) H. R. Clay 1.....	2630	....	....	1780-1794	1794	11-21-25	50	15	31-32
Roberts (deep) Field									
Magnolia Pet. Co.'s Dora Roberts 1.....	2662	....	....	2956-2968	2990	10-24-27	3300	421	27-29
O'Daniel Pool									
Choate-Henshaw et al. (now Magnolia Pet. Co.'s) M. H. O'Daniel 1....	2232	....	1670	2640-2705	3103	5-12-26	65	8	29-30
Hyman Field									
Magnolia Pet. Co.'s Minna Hyman 1.....	2370	....	....	1308-1317	1317	6-17-29	20	4	29-30
Lockhart-Scott Field									
Lockhart & Co.'s W. T. Scott 1.....	2359	....	....	2740-2820	3220	12-27-26	20	3	29-30
Settles-Henshaw Field									
Henshaw Oil Corp. (now American-Maracaibo Co.'s) W. R. Settles 1-A..	2708	....	2001	2208-2232	2248	8- 7-28	4200	50	32-33
Harding Pool									
Continental Oil Co.—Group No. 1 Oil Corp.'s J. B. Harding 1.....	2502	1146	3115	3173-3188	3230	5- 5-27	140	16	28-29
IRION COUNTY									
R. E. Moore & M. Kennedy (now Irion Oil Co.'s) F. Tankersley 1.....	2283	....	....	1341-1344	1344	7-22-28	15	SD	37-38
JONES COUNTY									
Noodle Creek Field									
Phillips Pet. Co.'s Joe Winters 1.....	1908	....	2493	2518-2527	2527	9- 5-26	1000	15	39-40
Tooble Creek (Deep)									
Marland (now Continental Oil Co.'s) Harris 2.....	1909	....	....	3036-3039	3039	2-13-27	125	3	33-34
Smith-Tiner Field									
Hutson-Weaver-Shaheen (now Robert Oil Corp. et al's) A. T. Smith 1-A	1824	....	....	2498-2533	2533	1-20-28	75	2	39-40
Higgs Field									
Stebbins O. & G. Co. (now Roeser-Pendleton, Inc.) J. M. Higgs 1....	1624	....	....	1599-1611	1615	4-22-27	25	3	39-40
LOVING COUNTY									
Wheat Field									
P. V. Petroleum Co. (now Lockhart & Co.) J. J. Wheat 1.....	2645	772	....	4212-4272	4272	9- 1-25	25	27	38-40
MENARD COUNTY									
W. C. Barnett et al.'s Callan City Co. 2.....	....	....	....	1267-1268	1268	12-15-29	1 Mil.	ft. gas	SD

(Continued on next page)

WEST TEXAS DISCOVERY WELLS

Discoverer and Lease Name—	Elev.	Top Salt	Top Lime	Prod. Horizon	Total Depth	Date Completed	Init. Prod.	Present Prod.	Gravity
MITCHELL COUNTY									
Westbrook Field									
Underwriters Prod. & Ref. Co., (now The California Co.'s) T&P-Abrams 1	2122	....	1540	2350-2498 2980-3020	3050	Oct. 1920	25	16	24-26
Iatan Field									
Magnolia Pet. Co.'s Mary Foster 1	2342	....	1750	2858-2872	2872	8-18-25	150	13	29-31
Elwood Field									
Simms Oil Co.'s I. L. Elwood 2	2237	....	....	598 -606	606	3-29-29		4½ Mil. ft. gas	SD
PECOS COUNTY									
Yates Field									
Mid-Kansas & Transcontinental's I. G. Yates 1-A	2396	....	965	995-1005 995-1150	1005 1150	10-30-26 8 -9-28	350 50,000	... 814	28-30 28-30
South Yates Field									
K. Kimbell & Texon (now Texon Oil & Land Co.'s) I. G. Yates 1	2250	460	....	1268-1273	1300	2 -8-27	15	SD	29-30
Bennett Field									
Quinby Oil Co. (now McCarty Oil Co.'s) E. W. Bennett 2	....	....	....	1298-1230	1457	Jan. 1927	25	10	38-39
Pecos Valley Field									
Pecos Valley Oil Co. (now Pecos Crude Oil Purchasing Co.'s) Pecos Valley Fee 1	2501	1115	....	1626-1637	1637	11-20-28	120	15	34-36
White-Sellman Field									
Alexander-Lyles-Eastland Oil Co.'s White-Baker 1	2672	814	1602	1611-1626	1856	11-24-28	3½ Mil. ft. gas		SD
University Pool									
Geo. H. Anderson-Tower-McKenna, Inc.'s University 1	2801	1030	1690	1960-1963	1998	1-20-29	7¾ Mil. ft. gas		SD
Taylor-Link Field									
Taylor-Link Oil Co.'s University 1	2510	835	1375	1613-1628	1635	6-20-29	130	10	29-31
Courtney-Pryor Pool									
Phillips Pet. Co.'s Courtney-Pryor 1	2951	....	....	1345-1375	4375	5-22-29	150	ABN	25-26
Buell-Hagan Pool									
Buell-Hagan et al's University 1-B	2760	945	....	1320-1332	1332	6-22-29	15	SD	28-29
Rowan-Tong Pool									
Independent O&G Co. & Rowan-Tong, Inc.'s J. A. McDonald 1	2484	725	1400	1605-1612	1644	8-28-29	2,000	ABN	28-29
Masterson-Shearer Pool									
Cranfill-Reynolds Co. M. Warner et al's J. Masterson 1-A	2425	....	1296	1249-1270	1495	12-16-29	40	25	26-27
Webb Pool									
R. D. Webb et al's Fee 1-A	....	....	....	465 -472	472	7-28-29	6 Mil. ft. gas		SD
REAGAN COUNTY									
Big Lake Field									
Texon Oil & Land Co. (now Big Lake Oil Co.'s) University 1	2724	....	2935	3020-3028	3028	5-28-23	80	12	37-39
Big Lake (Deep) Field									
Group One Oil Corp. (Texon's) University 1-B	2733	1110	2780	8500-8523	8523	12- 1-28	500	2,800	56-60
Skelly-Utah Field									
Skelly Oil Co.—Utah Southern's University 1	2874	1340	3065	3135-3154	3157	2- 6-28	60	15	31-32
RUNNELS COUNTY									
Ladd-Hill-Sillix et al (now Vacuum Oil Co.'s) R. M. McMillan 1	1726	....	....	2535-2540	2540	8-30-27	200	ABN	42-44
Robt. Watchorn O&G Co. et al's J. L. King 1	1660	....	....	3475-3485	3732	5- 3-28	3 Mil. ft. gas		
SCURRY COUNTY									
The Loutex Corp. (now The Northwest Co.'s) J. J. Moore 1	2314	....	1580	1765-1820	3576	11-29-23	50	3	28-29
STERLING COUNTY									
H. D. Rummel et al (now J. P. Williams et al's) L. T. Clark 3	2337	....	....	1173-1175	1175	6- -26	20	SD	31-32
TAYLOR COUNTY									
J. B. Dunigan-Fred Hyer et al's T. A. French-Hunter 1	....	....	....	2389-2391	2391	10-10-29	150	60	40-42
UPTON COUNTY									
McCamey Field									
Johnson-McCamey-Marland (now Republic Prod. Co.'s) M. L. Baker 1	2613	590	2083	2161-2200	2271	9-30-25	70	5	27-30
Wentz-Shirk Pool									
L. H. Wentz Oil Corp. (now Texas Pacific Coal & Oil Co.'s) Milton Shirk 1	2722	695	2146	2272-2331	2331	9-30-26	250	30	26-27
VAL VERDE COUNTY									
O. O. Owens et al's H. Y. J. Mills 1	2130	....	....	2491-2520	6220	6-29-27	3 Mil. gas		(DD)
WARD COUNTY									
Shipley Field									
Shipley Oil Corp.'s S. F. Hayzlett 1	2502	727	2380	2480-2506	2506	11- 2-28	125	15	35-36
Prairie-Sealy Pool									
Prairie O&G Co.'s John Sealy 1	2666	1073	3110	2526-2575	3505	11-22-28	5 Mil. ft. gas		open
Gulf-O'Brien Field									
Gulf Prod. Co.'s G. W. O'Brien 4	2657	1290	....	2600-2631	2631	4-12-29	1500	380	38-39
Grand Falls Townsite Pool									
Alpine Oil & Dev. Co.'s J. F. Boogher-Townsite 1	2443	760	....	2120-2150	2508	10-14-29	25	25	34-35
Penn-Atlantic Bennett Pool									
Penn Oil Co. & Atlantic Oil Prod. Co.'s J. B. Bennett 1	2[illegible]	....	2205	2348-2572	2621	9-28-29	150	140	34-35
WINKLER COUNTY									
Hendrick Field									
R. A. Westbrook & Co. (now Southern Crude Oil Pur. Co.'s) T. G. Hendrick 1-A-T-67	2805	1950	2614	2965-3011	3049	11- 8-26	400	50	28-30
Scarborough Field									
Llano Oil Co. (now Shell Pet. Corp. & Llano Oil Co.'s) W. F. Scarborough 1	2943	1115	2953	2992-3317	3447	7-22-27	40	25	35-36
Leck-Daugherty Field									
Gibson-Johnson & Kessler-Logan (now Atlantic Oil Prod. Co. & Kessler-Logan's) Lum Daugherty 1	2883	1980	2687	3159-3164	3167	5- 9-28	4000	80	28-30
Bolin Pool									
V. T. Bolin & Co. now Jeffrey et al's) Brown-Altman 1	2847	1302	....	2745-2812	3211	7-19-28	25	SD	36-37
Richardson-O'Brien Pool									
Sid Richardson-Kelsey et al's G. W. O'Brien et al 1	2722	2035	2648	2805-2975	2975	10-15-28	2100	25	28-30
Bashara Pool									
M. J. Bashara's Fee 1	2883	....	2450	2481-2483	2483	5-5 -29	19 Mil. ft. gas		open



Development in Winkler-Ward County area

West Texas Has 303 Dry Holes During Past Year

By H. H. KING
Staff Representative

SAN ANGELO, Texas.—Efforts waged within the past 12 months by companies and individuals to uncover new oil and gas areas and extend the productive limits of established fields in West Texas exacted a toll of 303 dry holes. These failures represent a total cost of approximately $7,750,000.00 for drilling and completing the hole, while investments in leases and royalties around such tests materially swells the total expense made for the year. About 250 of these failures can be classed as wildcat. In contrast to this unprofitable development activity the district is credited with having added six entirely new oil areas and one shallow gas pool that were contributed by Ward, Pecos, Fisher, Andrews, Taylor and Menard Counties. The latter three counties scored their first successful completions within the past year.

Dry holes in West Texas have played a prominent part in making important discoveries through geological information gained, while non-commercial showings of oil and gas in failures invariably leads to more development work in the immediate area. Because of the value of such information an annual tabulation of all failures in the district, such as carried on the following pages, has been published by THE OIL WEEKLY for each 12-month period ending in July for the past five years. Whenever possible the data on tops of salt and brown and white lime are obtained direct from well owners. This source of information affords a high percentage of accuracy, although tops of key formations are quite often debatable.

Forty-four counties contributed to the dry hole list during the past 12 months, with the heaviest toll taken in Pecos, Ward, Mitchell, Glasscock, Howard, Irion, Jones and Fisher Counties. Each of these counties furnished one or more "hot spots" for the wildcatters, and the heavy toll of dry holes followed.

Total footage of all failures completed in the district within the past year amounts to 779,646 feet, making an average of 2573 feet of hole for each of the 303 completions. During the year previous the district contributed 298 failures, with a total footage of 879,112 feet, or an average of 2950 feet per test. A greater number of tests were carried below the 4000-foot level within the past year than ever before, as illustrated by the accompanying table, but the extensive search for shallow production in Pecos and Irion Counties greatly reduced the average depth of all holes drilled.

Independent operators and officials of larger companies that participated in West Texas wildcat activity during the past year are almost unanimous in placing a flat price of $10.00 per foot as being the average cost of drilling both shallow and deep tests. This cost per foot was used in making the above estimate on total expenditures for completing the past year's crop of failures.

Drilling Equipment Varied

All types of drilling equipment figured in this wildcat activity, but spudders and machines came in for greater usage during the past year because of the volume of shallow development work. A temporary shortage of machines was experienced during the height of Pecos County's wildcat activity.

Pecos County accounted for more than four times as many failures during the past 12 months as any other county in the district. This county came through with a total of 95 abandonments, which were largely wildcats. The total footage of hole drilled amounted to 205,849 feet, making an average depth of 2167 feet for each failure.

Wildcatters were mostly searching for oil areas of the Yates field type when they put forth so much effort in Pecos County, and when they had drilled past the Yates field horizon they were content to allow the lower horizons to remain undisturbed. Known oil and gas producing horizons in Pecos County range from the grass roots to 2000 feet in depth, and only eight tests were carried below the 3000-foot horizon during the 12 months. In fact, little encouragement has been had in drilling below the 2000-foot horizon. Fifty-six companies and individual operators drilled dry holes in Pecos County during the past 12 months.

Discovery of the Taylor-Link field in June, 1929, on University land proved to be the forerunner of an active lease and drilling campaign that radiated in all directions from the small flowing well. Heavy gas production from shallow depths appeared in the first group of wells that followed, and operators promptly branded the area as a prolific field. Disappointment set in when efforts were made to widen the producing area any appreciable distance, and the Taylor-Link field has since been defined to less than four sections.

While operators were plunging into their initial development program in the Taylor-Link field, Rowan-Tong, Inc., and Independent Oil & Gas Company's J. A. McDonald 1, located about five miles to the northwest, blew in at 1605-1612 feet making 90 barrels oil per hour on August 28, 1929. The McDonald wildcat producer soon proved to be a freak, and the oil was exhausted, even though the hole was carried to 1644 feet. Several million dollars changed hands on leases and royalties near McDonald 1 shortly after it made its heavy output, and the acreage has since been virtually proven to be barren of petroleum, while about 20 of the wildcat failures charged against Pecos County during the past 12 months were drilled within a three-mile radius of the freak producer. Undaunted by three failures of the McDonald discovery lease, Independent Oil & Gas Company et al. are now drilling a fourth test, thus completing the circle of off-sets to the short-lived producer.

Jones Second In Failures

Jones County took second place on failures through having contributed 21 completions of this classification, with most of the work devoted to trying for extensions of its several small oil areas. None of these tests drilled below 3500 feet, while 17 were halted between the 2000 and 3000-foot level.

Irion County experienced its heaviest year on drilling, and completed 18 failures, including the deepest of all abandoned in the district during the 12 months period, while it also added the deepest hole ever drilled in the world outside of California. Pete H. Williams' Ashe 1 proved dry after reaching a depth of 8900 feet. However, this test is not listed as a completion since it may be deepened. Kingwood Oil Company's Sugg 1 upheld deep completion honors for the county by reaching a depth of 7818 feet before plugging. The unusual volume of field work in Irion County resulted in 16 tests being completed with depths of less than 2000 feet, and most of these were

drilled near shallow production offered by the county in small quantities.

Phillips Petroleum Company continued to be prominently identified with wildcat work in the district, although did not drill as many wells as the previous year. This company's A. G. Holman 1, located near the south line of Sutton County, was drilled to 6633 feet before being abandoned as a junked hole after losing three strings of tools. After completing this hole it took over a test near El Dorado, located to the north, and had carried same to a depth of 6880 feet, where water was encountered. It is to be plugged back for a shot at 6300 feet, where a good show of oil and gas was passed up.

SUMMARY WEST TEXAS WILDCAT FAILURES

Recapitulation of dry holes completed in West Texas during the past 12 months is given below by counties, with the number of failures segregated according to depths:

County—	Under 1000 Feet	Bet'n 1000 and 2000 Feet	Bet'n 2000 and 3000 Feet	Bet'n 3000 and 3500 Feet	Bet'n 3500 and 4000 Feet	Bet'n 4000 and 4500 Feet	Bet'n 4500 and 5000 Feet	Bet'n 5000 and 5500 Feet	Below 5500 Feet	Totals
Andrews	..	..	..	..	..	..	1	1	..	2
Borden	..	..	..	..	2	2	..	..	..	4
Brewster	..	3	..	1	..	1	..	..	..	5
Cochran	..	..	..	..	..	..	..	1	1	2
Coke	..	..	..	..	1	1	..	..	..	2
Concho	..	2	1	..	..	..	..	..	..	3
Crane	..	..	1	..	1	..	..	..	..	2
Crockett	..	4	1	..	1	..	..	..	..	6
Culberson	1	1	2	..	3	..	..	..	..	7
Jeff Davis	..	..	..	..	..	1	..	..	..	1
Ector	..	..	..	..	3	2	..	..	..	5
El Paso	..	1	..	1	..	..	..	..	..	2
Fisher	1	..	..	7	1	1	..	..	1	11
Gaines	..	..	..	..	..	..	1	..	..	1
Garza	..	..	1	1	..	1	..	..	..	3
Glasscock	..	1	8	4	2	..	..	..	..	15
Tom Green	3	1	..	..	..	..	..	..	..	4
Hockley	..	..	..	..	..	..	..	1	..	1
Howard	..	3	5	1	..	1	..	..	..	10
Hudspeth	1	1	1	..	..	..	..	..	..	3
Irion	3	13	..	1	..	..	..	..	1	18
Jones	..	1	17	3	..	..	..	..	..	21
Kent	1	..	..	1	..	..	..	..	..	2
Loving	..	..	..	1	..	1	..	1	..	3
Menard	..	..	..	1	1	..	..	..	..	2
Midland	1	..	..	..	..	2	..	..	..	3
Mitchell	4	1	1	5	..	..	1	1	..	13
Nolan	..	..	..	1	..	1	1	..	..	3
Pecos	4	53	30	4	1	1	1	1	..	95
Presidio	1	1	..	..	..	1	1	..	..	4
Reagan	..	..	3	1	..	..	..	..	..	4
Reeves	..	2	1	..	..	..	..	1	1	5
Runnels	..	1	1	1	1	1	..	..	..	5
Schleicher	1	..	..	..	1	..	..	..	..	2
Scurry	..	..	..	..	1	..	1	..	..	2
Sterling	..	..	1	..	..	..	..	..	..	1
Sutton	..	..	..	..	..	2	..	..	1	3
Taylor	..	..	3	2	..	..	..	..	..	5
Terrell	1	..	..	..	..	..	..	1	..	2
Upton	..	..	1	..	1	1	..	..	..	3
Val Verde	..	..	1	..	1	..	..	..	..	2
Ward	1	..	5	4	1	..	..	1	..	12
Winkler	1	..	..	2	..	..	..	..	..	3
Yoakum	..	..	..	..	..	..	1	..	..	1
Totals	24	89	84	42	22	20	8	9	5	303
Totals previous months	13	69	81	68	39	16	9	2	1	298
Totals year ending July, 1928	11	42	60	48	52	18	6	5	1	243
Totals year ending July, 1927	4	27	69	74	57	21	6	3	..	261

Unfavorable Market Curtails Drilling in North Texas

By H. H. KING
Staff Representative

UNFAVORABLE crude market conditions will cause operators in the Texas Panhandle to curb oil development during the remainder of the year, but drilling for gas production will probably be materially increased in order to build up greater reserves for the trio of lines now being built to Middlewestern and Northern cities. These new natural gas lines will more than double the daily gas withdrawal from the district when they are placed in operation.

Gray County has been the most active in oil developments, and will continue to retain its leadership over other counties in the Panhandle, while Carson and Hutchinson Counties come next in order. Lease drilling obligations have figured to a large extent in drilling during the past six months, and a certain amount of new work must be carried on regardless of market conditions.

North and Central West Texas

Shallow oil areas in northern Young County have figured prominently in accounting for the large volume of new production credited to North Texas within the past six months. The Olney townsite field broke loose with a number of flowing wells, and before this area had reached its peak on drilling and production a more prolific field was uncovered to the south and near New Castle. Both of these fields over-taxed pipe line facilities. The latter is credited with a daily potential production of about 15,000 barrels, but pipe line outlet and market is restricted to 1350 barrels, with many proven locations remaining to be drilled.

Development in Wichita, Wilbarger, Archer, Clay, Jack, Cooke and Montague Counties has been running below normal, and can be expected to remain in such a status until crude purchasing companies resume normal oil takings. Wilbarger County offers the greatest amount of proven undrilled acreage, and has been the hardest hit by pipe line companies limiting their crude runs.

Absence of attractive oil area to drill has been a greater factor in slowing down field work in Central West Texas, than curtailment of crude purchases by major companies. Brown, Coleman, Eastland and Schackelford Counties have lagged behind in contributing new pools for more than a year, and nothing is on the horizon to support a sizeable drilling program. The Cook ranch property of Roeser-Pendleton, Inc. and Continental Oil Company in Shackelford County, is an exception, and development of the proven leases have been checked because of inadequate crude market outlet.

Deep production in this district has been a negligible source of crude supply so far this year, and until more attractive crude prices become available it is quite likely that operators will confine their small volume of field work to shallow and semi-shallow horizons.

West Texas

Restricted crude buying policies of major companies in West Texas contributed materially to the curbing of drilling operations during the past six months. The three prorated fields in the district have been forced to accept smaller daily allowances on crude production. Another factor to be considered is the absence of the usual quota of new discoveries, although wildcat operations have been maintained at a normal rate.

Yates field offers the greatest volume of proven locations the district and was the only area that scored an appreciable development work because of proration. The Gulf-O'Brien

(Continued on page 274)

West Texas Dry Hole Record for the Past Twelve Months

Company and Dry Hole Location—	Surface Elev.	Top Salt	Top Lime	Total Depth	Date Completed
ANDREWS COUNTY					
Deep Rock Oil Co. et al's B. L. King-Miles 1, 990 ft from n and 2310 ft from w lines Sec. 22, Blk. A-46, PSL ..	3196	1700	....	4765	7-19-30
Deep Rock Oil Co. et al's W. J. Mathis 1, 990 ft from swc of Sec. 4, Blk. A-46, PSL	3193	1730	....	5088	7-19-30
BORDEN COUNTY					
Louisiana Oil Ref. Corp.'s W. L. Miller 1, 1320 ft from w and 150 ft from s lines Sec. 355, Blk. 97, H&TC Ry Sur.	2541	1080	2300	4011	11-15-29
W. A. Moncrief-Humble O&R Co.'s S. L. Murger 1, c sw¼ ne¼ Sec. 15, Blk. 31, T&P Ry. Sur., T-4-N	2433	1090	2778	3517	3-24-30
Phillips Pet. Co.-C. B. Shaffer's T. G. Goode 1, 330 ft from swc se¼ Sec. 46, Blk. 33, T&P Ry. Sur., T-4-n..	2696	1400	3050	3880	5- 8-30
Paul Teas & Walter Gant's L. E. Long 1, c ne Sec. 27, Blk. 30, T&P Ry. Sur, T-5-n	2516	1030	2635	4029	12-18-29
BREWSTER COUNTY					
Ed. Bateman & Co.'s R. L. Neville 1-A, 2000 ft from swc Sec. 62, Blk. 13, GH&SA Ry. Sur.	4404	....	....	3006	2-22-30
E. L. Chapman et al's S. P. Skinner 2, 1520 ft from s and 1980 ft from e lines Sec. 100, Blk. 2, GC&SF Ry. Sur.	4240	....	....	1300	5-...-30
J. P. Johnson-Bert Weekly's Jackson-Harmon 1, c Sec. 104 Blk. 10, GH&SA Ry. Sur.	3972	....	....	4101	10- 8-29
J. H. Hickey et al's Jackson-Harmon 1, 1200 ft from s and 200 ft from e lines Sec. 182, Blk. 9, GH&SA Ry. Sur.	4353	....	....	1302	1-15-30
Van McPhail et al's Kempter-McIntyre 1, 330 ft from sec Sec. 31, Blk. 352	....	....	....	1740	1-15-30
COCHRAN COUNTY					
Marland (Conoco) Oil Co.'s C. C. Slaughter 1, 330 ft from w and 430 ft from s lines League No. 130, Carson Co. S. L. Sur.	3793	2380	3995	5000	11-15-29
R. A. Westbrook et al's C. C. Slaughter 1, 400 ft from sec of Labour No. 67, League No. 118, Knox County S. L. Sur.	3806	2347	3837	5539	5-31-30
COKE COUNTY					
Ray McCamey et al's J. B. McCutchen 1, 2300 ft s and 785 ft w of nec T. J. Hines Sur. No. 4, (C&M Ry. Sur.)	1786	....	....	3502	8- 1-29
Mid-Kansas O&G Co.'s W. G. Lackey 1, 330 ft from swc of Sec. 272, Blk. 1-A, H&TC Ry. Sur.	2152	....	....	4255	12-18-29
CONCHO COUNTY					
Jas. L. Duffy-Watchorn O&G Co.'s Lulu Noyes 1, c nw¼ Sec. 19, Blk. 70, H&TC Ry. Sur.	1975	....	1665	1760	4-24-30
Lloyd Jones-Liner et al's A. E. Jones 1, 420 ft s and 15 ft e of nwc John C. Reh Sur. No. 1878	1679	....	1770	2375	8-20-29
T. B. Slick-G. Lamb et al's H. L. Moseley 1, 150 ft from swc of nw Sec. 1838	....	....	....	1282	12-10-29
CRANE COUNTY					
C. C. Duffey et al's Cowden (Sec. 31) 1-B, 580 ft ne and 1733 ft se of w cor Sec. 31, Blk. 2, H&TC Ry. Sur.	2365	535	2145	2862	7- 3-30
Gulf Prod. Co.'s W. N. Waddell 8, 330 ft from sec of Sec. 2, Blk. B-24, PSL Sur.	2724	1322	3170	3859	10-18-29
CROCKETT COUNTY					
A. R. Eppenauer & West Texas Pet. Corp.'s W. T. Noelke 1, 500 ft n and 1250 ft e of sec Sec. 64, Blk. 1, I&GN Sur., but in Sec. 60, W. T. Mullins Sur., A-5174....	2545	725	2130	2561	10-24-29
E. G. Lewis-W. T. Daniels' Pecos River Bed 1, 19 vrs. s and 37 degrees e of nwc Sec. 33, Blk. 1, I&GN Sur...	1967	....	1002	1407	6-12-30
W. A. Moncrief et al's H. R. Andrews 1, 1320 ft from s and 1170 ft from w lines Sec. 57, Blk. "UV", GC&SF Ry. Sur.	2623	....	1450	1600	8-16-29
W. A. Moncrief et al's Robt. Massie 1, 1170 ft from s and 1320 ft from w lines Sec. 47, Blk. "UV", GC&SF Ry Sur	2520	....	....	1450	7-24-29
W. A. Moncrief et al's J. S. Todd 3, c se se Sec. 29, Blk "WX", GC&SF Ry. Sur	2496	....	1200	1649	11- 6-29
Texas Pacific Coal & Oil Co.'s J. M. Shannon 1, 330 ft from swc Sec. 44, TC Ry. Sur.	2593	1030	....	3695	1- 9-30
CULBERSON COUNTY					
Deep Rock Oil Co.-Grisham-Hunter Corp.'s Kloh 3, 380 ft s and 1388 ft e of nwc Sec. 39, Blk. 59, T&P Ry. Sur., Tsp. 7	3874	....	....	1602	8-28-29
Grisham-Hunter Corp.'s Fee 1, 330 ft from swc Sec. 14, Blk. 59, T&P Ry. Sur., Tsp. 7	3579	....	2607	3513	1-30-30
Grisham-Hunter Corp.'s Mrs. J. P. Seay 3, 330 ft from swc Sec. 16, Blk. 59, T&P Ry. Sur., Tsp. 7	3634	2730	2934	3509	4- 2-30
Grisham-Hunter Corp. et al's W. D. Garren 1, 330 ft from nec se¼ Sec. 18, Blk. 89, PSL	....	....	....	2514	5-13-30
J. M. Hickey-Stivers et al's C. O. Finley 1, 660 ft from n and 1980 ft from w lines Sec. 20, Blk. 82, PSL Sur. ..	3916	....	....	2907	6-14-30
Scott & Dittman Drlg. Co.'s Miller 1, 1160 ft from n and 2480 ft from e lines Sec. 1, Blk. 97, PSL Sur.	4059	....	....	3508	10-15-29
West Texas Oil & Exploration Co.'s McGregor 1, c of nw¼ Sec. 14, Blk. 81, PSL Sur.	....	....	....	875	6-...-30
JEFF DAVIS COUNTY					
Sam F. Means & G. M. Ball's J. Z. Means 2, 1328 ft from e and 1485 ft from s lines Sec. 431, Blk. 4, H&TC Ry. Sur	4157	....	....	4005	10-...29
ECTOR COUNTY					
C. P. Davis et al's T. G. Hendrick 1, c of sw¼ Sec. 46, Blk. 42, T&P Ry. Sur., T-2-S.	2878	1640	....	4012	6- 6-30
Gibson-Johnson et al's John Scharbauer 1, 990 ft s and 330 ft w of nec Sec. 4, Blk. 15, PSL Sur.	2986	1220	3380	4012	5-12-30
Llano Oil Co.'s T. S. Hogan 1, 330 ft from nwc Sec. 18, Blk. 44, T&P Ry. Sur., T-3-s	2914	1390	3349	3843	3- 9-30
Texas Pacific Coal & Oil Co.'s B. W. McKenzie 1, 330 ft from sec n½ se¼ Sec. 28, Blk. 45, T&P Ry. Sur, T-2-S	2933	1009	2265	3863	5-19-30
Tidal Oil Co.-Independent O&G Co.'s Scharbauer 1, 2249 ft from w and 1320 ft from n lines Sec. 6, Blk. 44, T&P Sur., T-3-S	2929	1020	3150	3800	5-20-30
EL PASO COUNTY					
Layne-Texas Co.'s W. D. Malone 1, 2200 ft s of n line Sec. 46 and 2200 ft e of River, J. M. Day Sur.	....	....	....	1340	3-...-30
Layne-Texas Co.'s W. D. Malone 1-A, 80 ft s of No. 1, junked hole	....	....	....	3089	6-18-30
FISHER COUNTY					
Cranfill-Reynolds Co.'s H. D. Johnson 1, 440 ft s and 1540 ft e of nwc Sec. 3, Blk. "R", W. E. Richardson Sur. ..	1843	....	3161	3198	5-12-30
Cranfill-Reynolds Co.'s Texas Cement Co. 1, 330 ft s and e of most western nwc Lot No. 10, Sallie English Sur. No. 10	1773	....	....	3158	10-30-29
Culberson Bros. Co. et al's A. J. Griffin 1, 848 ft n and 465 ft e of nec Sec. 20, but in Sec. 29, Bastrop CSL Sur. No. 323	1842	....	3070	3518	9-24-29
Landreth Prod. Corp.'s T. B. Cooper 2-A, 330 ft w and 380 ft s of nec Sec. 116, BBB&C Ry. Sur.	1825	....	....	3270	12-16-29
Magnolia Pet. Co.'s Alice Lee 1, 2310 ft s and 2328 ft e of nwc of 1036-ac tract, J. Rodriguez Sur. No. 357....	1827	....	....	5701	3- 6-30
Mid-Kansas O&G Co.-Phillips Pet. Co.'s Magenheimer-Stephenson 1, 330 ft w and 1800 ft s of nec Sec. 26, Blk. 317, El Paso CSL	1919	....	....	667	6-15-29
Mid-Kansas-Phillips' Magenheimer-Stephenson 1-A, 330 ft w and 1850 ft s of nec Sec. 26, Blk. 317, El Paso CSL Sur.	1921	....	3228	4220	2-12-30
Henry Riley et al's J. H. Veatch 1, 250 ft s and 990 ft e of nwc Sec. 4, Sallie English Sur.	1879	....	....	3300	10-17-29
Roeser-Pendleton-Amerada's First Natl. Bank of Waco 1, 660 ft from sec ne¼ Sec. 204, BBB&C Ry. Sur.	1797	...	....	3225	2-15-30
Roeser-Pendleton-Landreth's Johnson 1, 330 ft s and 538 ft e of nwc se Sec. 71, Blk. 1, H&TC Ry. Sur.	1921	....	3068	3283	9-28-29
The Texas Co.'s D. W. Stephens 1-B, 330 ft e and 205 ft s of nwc s½ sw Sec. 79, Blk. 1, H&TC Ry. Sur.	1958	....	3116	3315	10-26-29
GAINES COUNTY					
Louisiana Oil Ref. Corp. & Cranfill-Reynolds Co.'s B. B. Ralph 1, c sw¼ Sec. 7, Blk. "A-28", PSL Sur.	3475	1657	4117	4732	3- 8-30
GARZA COUNTY					
H. C. Cate-Pandem Oil Corp.'s Stoker 1, 330 ft from nec sw¼ Sec. 32 Blk. 5, GH&H Ry. Sur.	2452	810	2270	3018	3-15-30
Gulf Prod. Co.'s H. B. Street 1-D, C Sec. 7, Blk. 8, H&GN Ry. Sur.	2505	770	2170	4115	9-18-29
Bill Thompson et al's Floyd Tuffing 1, 330 ft from sec sw Sec. 10, Blk. 6, H&GN Ry. Sur.	2277	....	....	2610	10-10-29

WEST TEXAS DRY HOLE RECORD FOR THE PAST TWELVE MONTHS

GLASSCOCK COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
A. & F. Oil Co. et al's S. Turner 1, 330 ft from sec e¼ ne¼ Sec. 19, Blk. 33, T&P Ry. Sur., T-2-S	2543	....	2155	2507	8-15-29
The California Co.'s W. B. Currie 3, 990 ft from n and 2310 ft from e lines Sec. 219, Blk. 29, W&NW Ry Sur	2664	....	2432	3671	2-22-30
The California Co.'s C. F. Jones 1, 330 ft from nec Sec. 25, Blk. 33, T&P Ry. Sur., T-2-S	2665	....	2170	3440	7-10-30
The California Co.'s E. F. Turner 1, 330 ft from swc ne¼ Sec. 46, Blk. 33, T&P Ry. Sur, T-2-S	2672	....	....	1534	8- 1-29
Continental Oil Co.-Group No. 1 Oil Corp.'s E. B. Miller 1, 330 ft s and 990 ft e of nwc Sec. 162, Blk. 29, W&NW Ry. Sur.	2634	....	2160	2486	4-25-30
F-H-E Oil Co.'s B. B. Cox 1, 330 ft from sec sw¼ Sec.8, Blk. 33, T&P Ry. Sur., T-2-S	2551	....	2585	3411	5- 6-30
F-H-E Oil Co.'s J. M. Sprinkle 1, 330 ft s and 1650 ft e of nw Sec. 163, Blk. 29, W&NW Ry. Sur.	2669	....	....	2622	7- 3-30
Fuhrman Pet. Corp. et al's L. S. McDowell 1, 1650 ft from e and 330 ft from s lines Sec. 24, Blk. 35, T&P Ry. Sur., T-2-S	2550	1065	2457	2623	10-28-29
Gibson-Johnson et al's Irene Deau 1, c nw¼ Sec. 2, Blk. 33, T&P Ry. Sur., T-5-S	2718	1075	2560	3625	8-28-29
Houston Oil Co. et al's L. S. McDowell 1, 330 from nwc n½ ne¼ Sec. 30, Blk. 33, T&P Ry. Sur., T-2-S	2536	....	2392	2603	8-15-29
Landreth Prod. Corp.-Tidal Oil Co.'s A. L. Houston 1, 330 ft from swc se¼ Sec. 29, Blk. 35, T&P Ry. Sur., T-2-S	2558	1168	3020	3465	11- 5-29
Midwest Explo. Co.'s W. P. Edwards 1, 2250 ft from e and 230 ft from s lines Sec. 20, Blk. 34 T&P Ry. Sur., T-2-S	2550	....	2202	3265	10-16-29
Penn Oil Co. et al's C. Shaffer 1, 2640 ft w and 1320 ft n of sec Sec. 4, Blk. 32, T&P Ry. Sur., T-3-S	2702	....	2355	2580	9- 5-29
Shell Pet. Corp.'s Kloh 1-B, 330 ft from nwc Sec. 11, Blk. 33, T&P Ry. Sur., T-3-S	2768	....	....	2574	11-18-29
Texas-State Oil Co.'s Will P. Edwards 1, 990 ft n and 330 ft w of sec Sec. 19, Blk. 34, T&P Ry. Sur., T-2-S	2524	1300	2298	2461	7-27-29

TOM GREEN COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
Cosden Oil Co.'s J. Johnson 1, 150 ft n and 1050 ft w of sec of Joshua S. Grant sur (S.48337)	2182	....	....	555	4-25-30
J. E. Ellis et al's G. W. Lewis 1 110 ft s and 200 ft w of nec sw Sec. 6, Blind Asylum Lands	2133	....	....	423	1-20-30
J. E. Ellis et al's G. W. Lewis 2, 450 ft s and e of sec Jas. Webb Sur. No. 77, but in Albert Black Sur. No. 75	2143	....	....	457	4-25-30
J. E. Ellis et al's G. W. Lewis 3, 900 ft s of No. 2	....	....	....	1001	6-19-30
Fuhrman Pet. Corp.'s Lewis-Wardlaw 1, 694 ft w and 1528 ft s of sec J. Gable River Sec. 843, but in C. E. Locke Scrap file No. 42594	2058	....	....	1501	1- 7-30

HOCKLEY COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
World Oil Co.'s W. L. Ellwood 1, 330 ft from nwc League No. 7, Waggoner County School Lands	3363	2157	4570	5080	2-19-30

HOWARD COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
American-Maracaibo Co.'s W. R. Settles 2-C, 1423 ft s and 184 ft w of nec Sec. 6, Blk. 32, T&P Sur., T-2-S	2700	....	2040	4393	4-17-29
Continental Oil Co.-Group No. 1 Oil Corp.'s W. R. Settles 9-A, 660 ft from e and 200 ft from n lines Sec. 135, Blk. 29, W&NW Ry. Sur.	2760	....	....	2600	10-24-29
Continental Oil Co.-Group No. 1 Oil Corp.'s W. R. Settles 10-A, 280 ft from n and 400 ft from e lines Sec. 158, Blk. 29, W&NW Ry. Sur.	2698	....	....	2850	1-30-30
Cosden Oil Co.'s D. Roderts 5-A, 200 ft n and 2440 ft w of sec Sec. 129, Blk. 29, W&NW Ry. Sur.	2768	....	....	1511	7-26-29
Fuhrman Pet. Corp. et al's H. C. Read 1, 2310 ft n and 330 ft e of swc Sec. 41, Blk. 32, T&P Ry. Sur., T-1-N	2446	940	2742	3275	8-16-29
Gibson-Johnson et al's H. N. Reed 1, 660 from sec Sec. 47, Blk. 30, T&P Ry. Sur., T-1-N	2323	....	1910	2975	7-15-29
Humble O&R Co.'s H. R. Clay 9, 330 ft from nec w½ Sec. 138, Blk. 29, W&NW Ry. Sur.	2671	....	....	2946	4-18-30
McGinley-Sigler Co.'s H. Hyman 1-B, 330 ft from nec sw¼ Sec. 89, Blk. 29, W&NW Ry. Sur.	2349	....	....	1606	2-20-30
Moody Corp.'s D. Roberts 20-B, 1750 ft from n and 2310 ft from w lines Sec. 137, Blk. 29, W&NW Ry. Sur.	2749	....	....	1400	9-10-29
Pure Oil Co.'s W. I. Scrivner 2, 330 ft from sec Sec. 4, Blk. 32, T&P Ry. Sur, T-2-S	2719	....	2139	2343	6-12-30

HUDSPETH COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
L. E. Lockhart et al's Fee 1, c se¼ Sec. 5, Blk. 21, PSL Sur.	4799	....	....	1786	7-23-29
Geo. E. Richardson et al's S. J. Thaxton 1, c nw¼ Sec. 9, Blk. 16, PSL Sur.	....	....	....	170	12-17-29
Western States Oil Co.'s S. W. Moore 1, c se¼ Sec. 16, Blk. 71, T&P Ry. Sur., Tsp. 6	5150	....	....	2705	5-..-30

IRION COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
Baker & Hodges' F. Tankersley 1, 1315 ft from n and 150 ft from w lines Sec. 23, GC&SF Ry. Sur.	2268	....	....	1382	8-16-29
Baker & Hodges' F. Tankersley 2, 720 ft from n and 400 ft from w lines Sec. 23, GC&SF Ry. Sur.	2268	....	....	1450	3-10-30
Banner Oil Co. et al's J. M. Nutt 1, 150 ft from nec w½ Sec. 5, Gonzales County School Lands	2266	....	....	1400	10- 5-29
W. G. & W. H. Beasley-Atlantic Oil Prod. Co.'s Sawyer 1, 1111 ft from s and 1568 ft from w lines Sec. 3032, Blk. 24, H&TC Sur.	2419	810	1525	1950	2-28-30
W. W. Brown & Perry Fox's F. Tankersley 2, 160 ft from n and 500 ft from e lines s½ Sec. 712, Ford Willig Sur.	2238	....	....	1500	4- 8-30
Carl Cromwell et al's H. C. Fuller 1, 2134 ft from s and 631 ft from e lines Sec. 81, Blk. 1, H&TC Ry. Sur.	2260	....	....	710	12-17-29
Carl Cromwell et al's H. C. Fuller 1-A, 25 ft w of No. 1, junked hole	2261	....	....	1503	2-13-30
Perry Fox & Miller's F. Tankersley 1, 150 ft from s and 1250 ft from w lines Sec. 711, J. G. Resig Sur.	2262	....	....	1475	10-23-29
J. B. Crawford et al's J. M. Nutt 1, 450 ft s and 150 ft e of nwc of Sec. 8, Gonzales County School Lands	2278	....	....	1105	10-16-29
Irion Oil Co.'s F. Tankersley 1, 2260 ft from w and 660 ft from s lines Sec. 4, H. N. Wallace sur	....	....	....	520	12- 7-29
Straughn & Texannati Oil Co.'s J. M. Nutt 1, 150 ft from nec nw¼ nw¼ Sec. 6, Gonzales Co. School Lands	....	....	....	655	5-20-30
Perry Fox & Wm. R. Thorsen's F. Tankersley 3, 1520 ft n and 450 ft w of sec Sec. 712, Ford Willig Sur.	2245	....	....	1430	5-30-30
Fuhrman Pet. Corp.'s J. M. Nutt 1, 150 ft from nec Sub-Div. No. 4, Gonzales County School Lands	2291	....	....	1494	10-10-29
Kingwood Oil Co. et al's J. D. Sugg 1, 1650 ft from sec Sec. 19, Blk. 1, H&TC Ry. Sur.	2334	....	....	7818	5-30-30
Pecos Valley Oil Co.'s Joe Stocks 2, 1020 ft from swc Sec. 19, Blk. 3, H&TC Ry. Sur.	2256	....	....	1600	8-28-29
Simms Oil Co. & The Texas Co.'s F. B. Carter 1, 330 ft from nec Sec. 87, Blk. 1, H&TC Ry. Sur.	2448	....	....	1952	10-31-29
J. A. Starkweather & Concho Oil Co.'s J. H. Lindley 1, 900 ft n and 150 ft w of nwc Sub-Div. No. 1, Gonzales School Lands, but in Tract No. 1160	2262	....	....	3283	3-14-30
Wittmer O&G Properties' Abe Mayer 3, 850 ft from e and 350 ft from n lines Sec. 11, Blk. 2, H&TC Ry. Sur.	2245	....	....	1545	7-15-29

JONES COUNTY

Company and Dry Hole Location—	Elev. Surface	Salt Top	Lime Top	Depth Total	Completed Date
J. H. Adsit et al's O. D. Swenson 1, c ne¼ se¼ Sec. 193, BBB&C Ry. Sur.	1521	....	....	1441	8-20-29
J. H. Adsit et al's O. D. Swenson 1-A, 50 ft e of No. 1, junked hole	1521	....	....	2508	11-13-29
Atkinson & Sandefer's E. M. Byron 1, 300 ft from sec Sec. 17, Edward Miles Sur.	1818	....	....	2640	4-15-30
W. G. Clark et al's G. L. Miller-Collins 1, 330 ft from nwc Sec. 29, Blk. 18, T&P Ry. Sur.	1815	....	....	2480	8-15-29
Continental Oil Co.'s W. R. Phillips 1, 440 ft n and 330 ft w of sec of 80-ac lse. Sec. 16, Blk. 19, T&P Ry. Sur.	1862	....	....	3082	2-20-30
Cranfill-Reynolds Co.-The California Co.'s D. L. & C. E. Stephens 1, 990 ft s and 3630 ft e of nwc 156-ac tract, A-257, McMuller-McGloin Sur. No. 337	1719	....	....	2836	1- 3-30
Gilman & McMurray's J. P. Willis 1, 250 ft from s and 1373 ft from e lines Sec. 2, T&NO Ry. Sur.	1739	....	2047	2417	7- 9-29
Grisham-Hunter Corp.'s J. W. Tiner 2, 165 ft n and 830 ft w of sec Gab. Zumwalt Sur. No. 279	....	....	2512	2543	7-16-29
Sam Knepley-Tomberlin et al's R. R. Horn 1, 1980 ft n and 560 ft e of swc N-502-ac tract, G. W. Penny Sur. A-283	1784	....	2410	2902	7-23-29
McGinley-Sigler Co.'s C. Whittemore 1, 660 ft from sec se ne Sec. 39, Blk. 1, BBB&C Ry. Sur.	1672	....	....	2801	8-16-29
Mid-Tex O&G Co.'s S. W. King 1, 500 ft e of River and 800 ft s of n line Sub-Div. No. 1, Manuel Bueno Sur. No. 197	....	....	....	2095	6-17-30

(Continued on next page)

WEST TEXAS DRY HOLE RECORD FOR THE PAST TWELVE MONTHS

Company and Dry Hole Location—	Surface Elev.	Top Salt	Top Lime	Total Depth	Date Completed
Mid-Tex O&G Co.'s W. A. Minter 1, 1819 ft e and 765 ft s of nwc Sec. 41, T&P Ry. Sur., Blk. 15	1719	....	....	2361	1- 2-30
Phillips Pet. Co.'s M. C. Lou 2, 990 ft from nwc of Sec. 15, Blk. 19, T&P Ry. Sur.	1913	....	2506	3007	8-15-29
Phillips Pet. Co.'s J. N. Teaff 1, 1100 ft w and 990 ft n of sec Sec. 38, Blk. 18, T&P Ry. Sur.	1836	....	....	2885	6-16-30
Roeser-Pendleton, Inc.'s, J. H. Grayson 5-A, 990 ft w and 945 ft s of nec Lse. in Sec. 13, Blk. 19, T&P Ry. Sur.	1888	....	2503	2745	9- 3-29
Sedgwick O&G Co.'s E. Morrison-Brown 1, 330 ft n and 1320 ft e of swc Sec. 9, Blk. 1, T&NO Ry. Sur.	1812	....	....	2751	10-24-29
F. E. Shaheen et al's S. W. King 1, 2164 ft s and 1960 ft w of nec Manuel Bueno Sur. No. 197	1629	....	....	2204	1-28-30
The Texas Co.-Cosden Oil Co.'s W. E. Camp 3, 1189 ft s and 326 ft w of nec Sec. 13, Blk. 19, Y&P Ry. Sur.	1854	....	2496	3029	8-28-29
Texas Pacific Coal & Oil Co.'s W. H. Smith 1, 1882 ft from n and 2043 ft from w lines Sec. 51, Blk. 16, T&P Ry. Sur.	1846	....	2503	2995	9- 3-29
E. M. Treat O&G Co.'s S. L. Hodges 1, 750 ft s and 2714 ft w nec of s½ of A. Bell Sur.	1566	....	....	2000	7-10-29
White Eagle O&R Co.'s Teague 1, 933 ft from sec of Lot No. 20, Austin & Williams Sur, No. 339	1638	....	....	2785	7-22-29
KENT COUNTY					
Atlantic Oil Prod. Co. Unit Plan's E. E. Wallace 1, 330 ft from swc Sec. 60, Blk. "G", Waco & Northwestern Ry. Sur.	2253	330	....	3003	2-20-30
Geo. W. White-R. E. Smith's G. A. Pursley 1, 1320 ft from e and 2640 ft from s lines Sec. 8, Blk. "H", HT&B Ry. Sur.	....	....	....	273	10- -29
LOVING COUNTY					
Humble O&R Co. Unit Plan's Kloh-Rumsey 1-C, c Sec. 35, Blk. 55, T&P Ry. Sur., T-2-S	2814	1230	3948	4085	2-26-30
Lockhart & Co.'s W. D. Johnson 2, 660 ft s and 1980 ft w of nec Sec. 20, Blk. 56, T&P Ry. Sur., Tsp. 1	2915	....	3272	3328	6-26-29
Lockhart & Co.'s J. J. Wheat 1-H, 990 ft from ne and se lines, Sec. 85, Blk. 33, H&TC Ry. Sur.	2713	720	4152	5078	4-10-30
MENARD COUNTY					
Carl Cromwell-Jas. Duffy et al's R. S. Winslow 1, c se¼ Sec. 32, T&NO Ry. Sur.	2141	....	....	3208	8-29-29
Carl Cromwell-Jas. Duffy et al's R. S. Winslow 2, 250 ft from nwc ne¼ ne¼ Sec. 36	2143	....	3455	3535	4-24-30
MIDLAND COUNTY					
Phillips Pet. Co.'s J. V. Stokes 1, 440 ft s and w of nec S. Beall Pre-emption Sur. No. 10, Blk. 37, T&P Sur., T-2-S	2666	1610	3720	4340	7-20-29
Pure Oil Co.'s J. E. Hutt 1, 330 ft from sec ne¼ Sec. 14, Blk. 38, T&P Ry. Sur., T-4-S	2768	....	....	893	4-23-30
Pure Oil Co.'s J. E. Hutt 1-A, 50 ft s of No. 1, jkd hole	2768	1820	4095	4227	7-12-30
MITCHELL COUNTY					
J. E. Alexander et al's W. L. Ellwood 1, 1980 ft from n and w lines Sec. 4, Blk. 18, S. P. Ry. Sur.	....	....	....	602	8-15-29
The California Co.'s W. L. Foster 8, Lse. 1, 990 ft from e and 1100 ft from n lines Sec. 6, Blk. 29, T&P Ry. Sur., T-1-S	2432	....	....	3140	1-27-30
The California Co.'s J. J. Handley 1, 2310 ft from s and 1650 ft from e lines Sec. 1, Blk. 28, T&P Ry. Sur., T-1-N	2148	....	....	3284	8-20-29
Jack Ellis & Atlantic Oil Prod. Co.'s I. L. Ellwood 1, 660 ft from swc Sec. 30, Blk. 18, SP Ry. Co. Sur.	2270	....	....	648	4-17-29
Gibson-Johnson et al's W. T. Scott 1, 150 ft from n and 2490 ft from e lines Sec. 11, Blk. 19, Lavaca Navigation Co. Sur.	....	637	....	806	10-17-29
Gibson-Johnson et al's W. T. Scott 2, 150 ft from s and 2490 ft from e lines Sec. 7, Blk. 19, Lavaca Navigation Co. Sur.	2189	....	....	810	12-20-29
Gibson-Johnson et al's W. T. Scott 3, 150 ft from nwc Sec. 14, Blk. 17, SP Ry. Sur.	2229	739	....	1280	2-24-30
Magnolia Pet. Co.'s D. H. Snyder 1, 900 ft from w and 330 ft from n lines Sec. 36, Blk. 3, T&P Ry. Sur., T-1-S	2187	....	1725	3270	3- 3-30
Republic Prod. Co.'s W. T. Scott 1, 330 ft from swc Sec. 20, Blk. 17, SP Ry. Sur.	2215	....	1380	3285	8- 8-29
Simms Oil Co.'s I. L. Ellwood 1, c of se¼ Sec. 29, Blk. 18, SP Ry. Sur.	2237	....	1215	4725	8- 8-29
Teas-Wheeler et al's J. M. Radford 1, c of nw ¼ Sec. 7, Blk. 27, T&P Ry. Sur.	2223	667	1365	5012	4- 1-30
Robt. Thraves et al's C. E. Way-Crump 1, 330 ft from nec of se¼ nw¼ Sec. 91, Blk. 27, T&P Ry. Sur.	2126	....	2140	2508	9-..-28
Westyde Investment Co.'s I. L. Ellwood 1, c of w¼ of Sec. 38, Blk. 16, S PRy. Sur.	2185	....	1290	3216	7-30-29
NOLAN COUNTY					
L. G. Bradstreet et al's H. Kuteman 1, c nw¼, Sec. 95 Blk. "X", T&P Ry. Sur.	2488	....	....	4024	8-11-29
Gibson-Johnson et al's S. P. Boyd 1, 1320 ft from n and 1980 ft from e lines Sec. 42, Blk. 20, T&P Ry. Sur.	2126	....	....	3282	3-10-30
Phillips Pet. Co.'s R. R. Plunkett 1, 330 ft from sec nw¼ Sec. 66, Blk. 23, T&P Ry. Sur.	2423	....	....	4708	1-16-30
PECOS COUNTY					
Angelo Petroleum, Inc. et al's T. N. McKenzie 1, 480 ft s and 330 ft e of c of n line Sec. 3, Blk. 604, GC&SF Ry. Sur.	2890	908	1925	2200	4- 5-30
Ed. W. Bateman et al's Belgrade-Cunningham 1, 330 ft from swc of ne¼ Sec. 34, Blk. 11, H&GN Ry. Sur.	2623	....	....	1691	1-15-30
Ed. W. Bateman & Corzelius Bros.' Cordova 1, 2490 ft from n and 1515 ft from w lines Sec. 29, Blk. 11, H&GN Ry. Sur.	2393	705	1780	1851	2-12-30
Cardinal Oil Co.'s J. H. Tippett 1, 330 ft from sec Sec. 36, Blk. 12, H&GN Ry. Sur.	2510	760	1510	1573	1-12-30
Cardinal Oil Co.-Pure Oil Co.'s J. H. Tippett 1, 437 ft s and 885 ft w of nwc Runnels CSL Sur., but in Sec. 1, D. F. Robertson sur.	2266	....	....	500	2-25-30
Cardinal Oil Co.-Sun Oil Co.'s J. H. Tippett 1, 165 ft from swc of D. F. Robertson Sur. No. 1, Abst. 5187	....	....	....	420	12-26-29
Cardinal Oil Co.-Tidal Oil Co.'s J. H. Tippett 1, 825 ft s and 495 ft w of nec of Sec. 40, Blk. 194, GC&SF Ry. Sur.	....	....	....	603	12-26-29
Condor Pet. Co.'s Wangerin Est 1, 150 ft from nec Sec. 62, Blk. 11, H&GN Ry. Sur.	2464	780	1390	1665	10-28-29
Continental Oil Co.'s Robinson-C. L. Bennett 1, c of s½ Sec. 68, Blk. 10, H&GN Ry. Sur.	2455	882	....	2005	5- 1-30
Continental Oil Co.'s University 2-A, 330 ft from n and 1680 ft from w lines Sec. 6, Blk. 17	2561	750	1410	2185	1-18-30
Cosby Prod. & Royalty Co.'s K. C. & Ft. Stockton Land 1, 330 ft from nwc of e½ Sec. 31, Blk. 178, T. C. Ry. Sur.	2941	1140	....	2310	11-13-29
Cosden Oil Co.'s J. A. McDonald 1, 330 ft from nec Sec. 1, HE&WT Ry. Sur., A-3064	2459	....	....	2016	2-...-30
Cranfill-Reynolds Co. et al's J. Masterson 1-B, 2640 ft from se and 1470 ft from sw lines Sec. 105, Blk. 10, H&GN Ry. Sur.	2460	....	....	1800	3-15-30
Carl Cromwell-Harrison et al's White-Baker 1, 330 ft from nwc se¼ Sec. 42, Blk. 11, H&GN Ry. Sur.	2373	880	....	1847	2- 5-30
Carl Cromwell-Tanner-Ellis' University 1, 1980 ft from s and 1320 ft from e lines Sec. 16, Blk. 16	2485	955	1835	1985	5-28-30
K. A. Crowley et al's R. G. Heiner 1, 2490 ft from nec Sec. 589, Blk. 105, GC&SF Ry. Sur. A-3008	2548	....	....	1308	5-21-29
Earnest Ditto Oil Co.'s J. M. Montgomery 1, 250 ft from n and 160 ft from e lines Sec. 104, Blk. 331, Abst. 6387	4434	....	....	1505	5- 8-29
Dixie Oil Co.'s T. N. McKenzie 1, 3300 ft from n and 2025 ft from w lines Sec. 15, Blk. 604, GC&SF Ry. Sur.	3172	1410	....	2680	3-26-30
C. A. Fisher & W. A. Lowrie's R. D. Webb 1, c of Sec. 3, Blk. 203, Tilman Walters Sur. A-5319	2915	2455	2775	3256	6-30-30
Freeman-Miller et al's Pecos Valley Oil Co. 1, 2857 ft from se and 166 ft from sw lines Sec. 36, Blk. 3, H&TC Ry. Sur.	2446	1248	....	1724	2-10-30
Gault-Brown Co.'s R. M. Thompson 1, 660 ft from s and 1100 ft from e lines Sec. 71, Blk. 19, GC&SF Ry. Sur.	2325	730	1620	1760	4- 9-30
Geyer-Frates, Inc., et al's John T. Sellman 1, 330 ft from swc of ne¼ Sec. 29, Blk. "Z", TC Ry. Sur.	2716	830	1710	2004	2-13-30
Gibson-Johnson & J. M. Kessler's G. R. White-Baker-Grace 1, 330 ft from nwc of ne¼ Sec. 3, Blk. 179, TC Ry. Sur.	2866	890	....	1793	9-27-29
Gibson-Johnson-Kessler's G. R. White-Baker-Grace 1-A, 10 ft s of No. 1, junked hole	2866	890	1790	2062	10-25-29
J. W. Grant et al (was Oregon-Texas Synd's) W. W. Turney 6, 500 ft from sec Sec. 19, Blk. 140, T&TL Ry. Sur. (dd)	2592	....	1015	4590	3-12-29
Gulf Prod. Co.'s University-Hale 1-A, 330 ft from nec Sec. 16, Blk. 20	2478	775	1268	1695	10-14-29

WEST TEXAS DRY HOLE RECORD FOR THE PAST TWELVE MONTHS

Company and Dry Hole Location—	Surface Elev.	Top Salt	Top Lime	Total Depth	Date Completed
Henshaw Oil Corp.'s J. A. McDonald 1, 330 ft from nwc of S-109-ac of N-189-ac of Sec. 2, HE&WT Ry. Sur. ..	2425	690	1310	1660	11-20-29
Humble O&R Co.'s Belgrade-Cunningham 1, c sw¼ Sec. 34, Blk. 11, H&GN Ry. Sur.	2694	1050	1418	2013	12-18-28
Humble O&R Co.'s Belgrade-Cunningham 2, 2640 ft from n and 330 from w lines Sec. 48, Blk. 11, H&GN Ry. Sur.	2948	1060	1686	2116	3-12-30
Independent O&G Co.'s Iowa Realty Trust Co.-Rayburn 1, 2310 ft from ne and se lines Sec. 23, Blk. 10, H&GN Ry. Sur.	2459	1089	1693	1971	8- 8-29
Independent-Rowan & Tong, Inc.'s J. A. McDonald 1, 1170 ft from n and 2490 ft from e lines Sec. 46, Blk. 12, H&GN Ry. Sur.	2484	725	1400	1644	11-15-29
Independent-Rowan-Tong, Inc.'s J. A. McDonald 2, 2310 ft from n and e lines Sec. 46, Blk. 12, H&GN Ry. Sur.	2478	720	1380	1662	11-15-29
Independent-Rowan-Tong, Inc.'s J. A. McDonald 3, 170 ft from w and 153 ft from s lines n½ ne¼ Sec. 46, Blk. 12, H&GN Ry. Sur.	2471	715	1375	1677	10-16-29
Independent O&G Co.-Rowan-Tong, Inc.'s J. W. Phelps 1, 150 ft from nwc n½ ne¼ Sec. 26, Blk. 11, H&GN Ry. Sur.	2615	788	1785	2404	1-29-30
Jayhawk Pet. Co.'s C. J. Price 1, 1310 ft from w and 330 ft from s lines Sec. 6, Blk. 12, H&GN Ry. Sur.	2310	655	1525	1735	12-18-29
J. L. Kennedy et al's Mrs. M. R. Kennedy 1, c of sec 78, Blk. 3, T&P Ry. Sur.	3217	2705	....	3132	2-18-30
Kirby Pet. Co. et al's Belgrade 1, 330 ft from nec Sec. 2, TC Ry. Sur, Cert. No. 1764, Abst. 5988	2497	845	1408	1625	2- 3-30
Landreth Prod. Corp.'s Cunningham-Stockton Land Co. 1, 235 ft from n and 275 ft from e lines of s½ Sec. 32, Blk. 11, H&GN Ry. Sur.	2544	766	....	1720	11-20-29
Landreth Prod. Corp.'s J. A. McDonald 1-A, 330 ft from nwc of se¼ Sec. 46, Blk. 12, H&GN Ry. Sur.	2462	702	1365	1698	10-10-29
Landreth Prod. Corp.'s J. A. McDonald 2-A, 330 ft from nec of se¼ Sec. 46, Blk. 12, H&GN Ry. Sur.	2445	....	....	1663	11- 6-29
Landreth Prod. Corp.'s J. A. McDonald 1-B, 330 ft from swc of Sec. 40½, Blk. 12, H&GN Ry. Sur.	2462	....	1515	1670	12- 6-29
Landreth Prod. Corp.'s University 1-I, 330 ft from nec of ne¼ ne¼ Sec. 24, Blk. 18	2565	....	....	1095	12-15-30
Mauch & Kroger's M. Holmes-Jamison 1, 2490 ft e and 150 n of swc of Sec. 5, Blk. 178, TC Ry. Sur.	2325	540	....	2680	6-12-30
Landreth Prod. Corp.-Shell Pet. Corp.'s Ely Smithpeter 1, 330 ft from s and 280 ft from e lines Sec. 31, Blk. 11, H&GN Ry. Sur.	2530	827	1395	2335	12-28-29
Landreth Prod. Corp.'s University 5-A, 330 ft from sec of e½ se¼ Sec. 13, Blk. 18	2562	....	....	1000	12-15-29
Mazda Oil Corp.'s Cordovan Union 1, 2310 ft from n and 990 ft from e lines Sec. 103, Blk. 11, H&GN Ry Sur..	2371	....	1700	1804	2- 1-30
F. W. Merrick & J. E. Bristow's J. L. Neville 1, 1650 froms & 330 ft from w lines Sec. 42, Blk. 12, H&GN Ry. Sur	2412	645	1390	1670	10-27-29
Milham Corp.'s J. A. McDonald 1, 150 ft from sec of n½ nw¼ Sec 46, Blk. 12, H&GN Ry. Sur.	2484	735	1415	1651	11- 4-29
W. A. Moncrief et al's T. F. Clarkson 1, 330 ft from sec of nw¼ Sec. 84, Blk. 11, H&GN Ry. Sur.	2391	875	1555	1832	11- 8-29
W. A. Moncrief & L. C. Turman's J. L. Sullivan 1, 150 ft e of c of sw¼ Sec. 58, Blk. 11, H&GN Ry. Sur....	2401	....	1635	1930	1-14-30
W. A. Moncrief et al's J. H. Tippett 1, 1980 ft from s and 660 ft from w lines Sec. 46, Blk. 194, GC&SF Ry. Sur.	2426	735	1470	1576	5-31-29
W. A. Moncrief et al's University 1, 1470 ft from n and 150 ft from e lines Sec. 27, Blk. 18	2791	1090	1775	2098	10- 8-29
R. E. Moore et al's R. W. Arnold 1, c of e½ of sw¼ Sec. 18, Blk. 1, H&TC Ry. Sur.	3860	....	....	2004	5- 5-30
H. T. Odnezl et al's Winfield-Power 1, 2640 ft from n and 150 ft from w lines Sec. 1, Blk. 132, T. & St. L. Ry. Sur.	3098	....	....	200	12-10-29
Pecos Crude Oil Pur. Co.'s Pecos Valley Oil Co. 4, 770 ft from sw and 1320 ft from se lines of w¾ Sec. 22, Blk. 10, H&GN Ry. Sur	2454	985	....	1650	2-20-30
O. J. Perren et al's Louis Peterson 1, 150 ft from sw and nw lines Sec. 34, Blk. 10, H&GN Ry. Sur.	2439	990	....	2300	10- 2-29
Phillips Pet. Co.'s D. W. Bowser 1, 250 ft from nec Sec. 77, Blk. "OW", T. C. Ry. Sur.	2931	....	....	1450	7-18-29
Phillips Pet. Co.'s T. J. Byrne 1, 220 ft from nec of S.213.3-ac. in Sec. 77, T. M. Ry Sur.	2948	....	....	1574	2-13-30
Phillips Pet. Co.'s Pryor-Courtney 1, 440 ft from nwc of Sec. 78, Blk. "OW", T. M. Ry. Sur.	2951	....	2840	4376	10-10-29
Phillips Pet. Co.'s W. T. Shearer 1, 330 ft from ne and se lines of s½ Sec 99, Blk. 10, H&GN Ry. Sur.	2426	885	....	1675	5-14-30
Phillips Pet. Co.'s Southwestern Life Ins. Co. 1, 330 ft from s and 2310 ft from w lines Sec. 73, Blk "OW", T. M. Ry. Sur.	3011	....	....	1660	8-28-29
Rector Oil Co.'s State 1, 330 ft from sec of s½ Sec. 106, Blk. 8, H&GN Ry. Sur.	2469	1515	1590	2000	12-10-29
Rector Oil Co.'s Ivan J. Young 1, 330 ft s and 1650 ft e of swc of Sec 26, Blk. 9, H&GN Ry. Sur., but in Sec. 4, Blk. 3, H&TC Ry. Sur.	2380	635	....	2418	5-14-30
Red Bank Oil Co.'s I. L. Neville 1, 330 ft from swc of Sec. 40, Blk. 12, H&GN Ry. Sur.	2538	790	1566	1775	10-27-29
Rio Pecos Oil Co.'s I. G. Yates 2, 5130 ft from e and 510 ft from s lines Sec. 543, Blk. 1, I&GN Ry. Sur....	2280	475	....	1336	7-3 -29
M. M. Rowan (was Sam Kitts') M. A. Sherbino 1, 330 ft from n and 990 ft from w lines Sec. 52, Blk. "C-4", GC&SF Ry. Sur.	2884	975	2132	2497	12-16-30
Schumaker et al's O. W. Williams 1, 330 ft n of c of s line Sec. 1, Blk. 117, GC&SF Ry. Sur.	2980	....	....	2504	12- 4-29
Shell Pet. Corp.'s T. S. Jackson 1, 330 ft from se and sw lines Sec. 28, Blk. 3, H&TC Ry. Sur.	2447	1020	....	2389	9-18-29
Shell Pet. Corp.'s University-Bowers 1-B, 1661 ft from s and 1030 ft from w lines Sec. 30, Blk 16.	2497	850	1420	1663	8-30-29
Shell Pet. Corp.-Kirby Pet. Co.'s University 1, 2180 ft from n and 1547 ft from e lines Sec. 23, Blk. 26.	2620	....	....	5204	7-20-29
Simms Oil Company's University 1, 1650 ft n and 330 ft w of sec Sec. 21, Blk 21.	2695	1188	2320	2374	4-17-30
B. J. Spikes et al's Geo. Brown 1, 150 ft from nwc se¼ Sec. 8, Blk. 3, H&TC Ry. Sur.	2387	750	2260	2359	9-20-29
Stine & Griffith's McKinzie-Michaelis 1, c of sw¼ Sec. 9, Blk. 603, GC&SF Ry. Sur.	3156	1330	2565	3000	3-26-30
Sun Oil Co.'s University 1, 330 ft from nwc of Sec. 8, Blk. 17	2624	860	1520	1715	10-2 -29
Sun Oil Co.'s University-Carlson 1, 990 ft from n and 1350 ft from e lines Sec. 34, Blk. 18.	2686	1070	1787	2244	10-15-29
Sun Oil Co.'s University-Toler 1, 2310 ft from e and 330 ft from n lines Sec. 25, Blk. 18.	2625	900	1533	1813	11- 5-29
The Texas Co.'s C. Graef 1, 4758 ft e and 908 ft n of Sec. 44½, Blk. 12, H&GN Ry Sur.	2358	763	1471	1755	1- 4-30
The Texas Co.'s J. A. McDonald 1, 330 ft from n and 328 ft from e lines sw¼ Sec. 46, Blk. 12, H&GN Ry. Sur.	2466	695	1450	1635	10-23-29
The Texas Co.'s Thos. H. Wright 1, 660 ft from nwc of Sec. 9, Blk. 31, T. & St. L. Ry Sur.	3147	1940	2925	3504	7- 5-30
The Texas Co.-Phillips Pet. Co.'s J. K. P. Campbell 1, 1320 ft from sw and 300 ft from se lines Sec. 46, Blk. 10, H&GN Ry. Sur	2441	1010	1630	2509	12-28-29
Tidal Oil Co.'s J. A. McDonald 1, 170 ft from e and 153 ft from n lines s½ nw¼ Sec. 46, Blk. 12, H&GN Sur..	2479	705	1445	1735	10-10-29
Tidal Oil Co.'s J. A. McDonald 2, 330 ft from sec of s½ nw¼ Sec. 46, Blk 12, H&GN Ry. Sur.	2473	705	....	1520	10-23-29
Tidal Oil Co.-Tower & McKenna, Inc.'s University 1, c of sw¼ Sec. 16, Blk. 20.	2482	784	1270	1602	7-20-29
Tidal Oil Co.-Tower & McKenna, Inc.'s University 1-B 330 ft from nwc of se¼ Sec. 3, Blk. 18.	2470	790	1375	2041	9-14-29
Tidal Oil Co.-Tower & McKenna, Inc.'s University 1-C 330 ft from nec of w½ se¼ Sec. 17, Blk. 20.	2471	850	1320	1716	8-26-29
Tower & McKenna, Inc.'s University 1-A, 330 ft from swc of Sec. 14, Blk 16	2715	820	1810	3096	11-20-29
Transcontinental-Arkansas Fuel Oil Co.'s J. H. Tippett 1, 380 ft from s and 660 ft from e lines Sec. 8, Blk. 194, GC&SF Ry. Sur	2710	840	1635	1803	5- 8-30
Trees Oil Co.'s J. C. Trees 2, 330 ft from sec Sec 43, Blk. 8, H&GN Ry. Sur.	2476	2443	2660	2982	11-11-29
Trees Oil Co.'s J. C. Trees 3, 330 ft from swc Sec. 90, Blk. 8, H&GN Ry. Sur.	2518	1700	2235	2321	5-12-30
R. D. Webb et al's Fee 2, 1665 ft n and 951 ft e of s cor. Sec. 312, L. P. Scott Sur. A-2171	3006	....	....	1610	10- 8-29
Clayton W. Williams et al's W. A. Sanford 1, 160 ft from nw and 1150 ft from sw lines Sec. 55, Blk. 10, H&GN Ry. Sur.	2509	....	....	1526	8-22-29
World Oil Co.'s A. Kloh 1, 2310 ft from n and e lines Sec 47, Blk. 45, T&P Ry. Sur. Tsp. 8.	2815	....	....	3105	7-19-29
World Oil Co.'s University 2-A, 330 ft from n and 2395 ft from e lines Sec. 31, Blk 16.	2516	870	1380	1659	3-1 -30

(Continued on next page)

WEST TEXAS DRY HOLE RECORD FOR THE PAST TWELVE MONTHS

Company and Dry Hole Location—	Surface Elev.	Top Salt	Top Lime	Total Depth	Date Completed
World Oil Co.'s University 1-C, 1660 ft from n and 1314 ft from w lines Sec. 7, Blk 20	2611	....	1330	2199	3-25-30
F. P. Zoch & Eastland Oil Co.'s Cordova Union 1, c sw¼ Sec 81, Blk. 11, H&GN Ry. Sur.	2344	840	1700	1947	12- 5-29
PRESIDIO COUNTY					
Brite Production Co.'s L. C. Brite 2, 2500 ft n and 220 ft w of sec Sec. 51, Blk. 12, GH&SA Ry. Sur.	4669	....	....	700	4- 3-29
Brite Production Co.'s L. C. Brite 3, 2500 ft n and 2300 ft w of sec Sec. 51, Blk. 12, GH&SA Ry. Sur.	4670	....	....	1000	5-13-29
Phillips Pet. Co.-Empire-Delmar-C. E. Miller's Tootle 1, c ne¼ Sec. 75, Blk. 3, D&P Ry. Sur.	....	....	....	4730	9-26-29
Texas Pacific Coal & Oil Co.'s W. W. Bogel 1, 1140 ft n and 205 ft e of swc Sec. 83, Blk. 8, GH&SA Ry. Sur	4665	....	....	4365	1-23-30
REAGAN COUNTY					
A. M. Hagan-John W. Emch-Amerada Pet. Corp.'s Sawyer 1, 330 ft from s and 990 ft from e lines Sec. 125, Blk. 1, T&P Ry. Sur.	2527	995	2320	2850	5- 9-30
Geo. A. Henshaw-Thomas-Brann's D. E. Hughes 1, c of ne¼ Sec. 7, Blk. "L", T. C. Ry. Sur.	2607	1084	2740	3020	1- 3-30
Kemrow-Beasley et al's Sawyer 1, 1320 ft from n and 1940 ft from e lines Sec. 8, Blk. "A", J. G. Robinson Sur.	....	893	2195	2820	7-21-30
Westyde Investment Co.'s J. R. Scott 1, 1280 ft from n and 1320 ft from w lines Sec. 177, Blk. 1, T&P Ry. Sur	2732	1250	2460	2853	7-15-30
REEVES COUNTY					
Mack Best et al's A. A. Kinney 1, 400 ft s and 1030 ft w of nec Sec. 26, Blk. C-18, P. S. L.	2736	....	....	1160	12- 4-29
Earl M. Brooks-D. R. Thompson's Eddins-Wright 1, exact c of e line of Sec. 10, Blk. C-1, P. S. L.	2719	1622	5275	5658	5-28-30
The Exploration Co.'s A. A. Kinney 1, 1500 ft from e and 5 ft from n lines Sec. 26, Blk. C-18, P. S. L.	2847	....	....	2900	6-1 -30
Southern Crude Oil Pur. Co.-Dixie Oil Co.'s Kloh-Rumsey 1, 330 ft from nwc se¼ Sec. 23, Blk. 51, T&P Ry. Sur. Tsp. 8	2784	....	....	1535	6-28-29
Southern Crude-Dixie Oil Co.'s Kloh-Rumsey 1-A, 100 ft w of No. 1 junked hole	2784	2000	5146	5216	1- 2-30
RUNNELS COUNTY					
Herbert Oil Co. et al's J. T. Currie 1, 1866 ft from s and 335 ft of nec of Gray Carroll Sur. No. 284	1997	....	....	3005	9-27-29
Gibson-Johnson et al's L. P. Wood 1, 2600 ft n and 300 ft w of sec of T. T. Williams Sur No. 529	....	....	3340	3641	1-13-30
Gibson-Johnson & Magnolia Pet. Co.'s D. O. Johnson 1, 2310 ft n and 1650 ft w of sec Sec. 150, E. T. Ry. Co. Sur.	1731	....	....	2415	5-26-30
Independent O&G Co.'s Will Rollwitz 1, 330 ft from nec 150 ft from n and 270 ft from w lines Sec. 135, E. T. cf s½ of M. Salines Sur. No. 20½	1778	....	....	4317	8-30-29
Reese & Cates (was J. H. McLean's) G. W. Clayton 1, Ry. Co. Sur.	1861	....	....	1185	Aug. 1929
SCHLEICHER COUNTY					
Ft. McKavitt Oil Co.'s Louis Tisdale 1, 150 ft from nwc of S-120-ac. of Sec 1499, Wilhelm Halm Sur.	2151	....	....	3700	11-25-29
J. F. O.Harrow et al's Fee 3, 2310 ft from s and 990 ft from e lines Sec 61, Blk. "M", GH&SA Ry. Sur.	....	....	....	920	9-13-29
SCURRY COUNTY					
V. E. Cottingham & G. O. Briscoe's J. R. Truss 1, c of se¼ Sec. 427, Blk. 97, H&TC Ry. Sur.	2664	1050	2175	3566	1-16-30
E. L. Smith Oil Co.-Magnolia Pet. Co. et al's S. W. Mooar 1, c of se¼ se¼ Sec. 379, Blk. 97, H&TC Ry. Sur.	2519	750	....	4650	4-15-30
STERLING COUNTY					
Cranfill-Reynolds Co. & S. B. Owens' Harry Tweedle 1, 1980 ft from n and 1320 ft from e lines Sec. 10, Blk. "T", T&P Ry. Sur.	2500	....	....	2252	1-10-30
SUTTON COUNTY					
Independent O&G Co.-Sun Oil Co.'s Allison 1, 200 ft from n and 1000 ft from w lines Sec. 39, Blk. "A", GWT&P Ry. Sur.	2291	....	4236	4315	1-2 -30
Phillips Pet. Co.'s A. G. Holman 1, 330 ft w and 2310 ft s of nec of Sec 25, CCSDRGNG Ry. Sur.	2277	....	2317	6633	11-25-29
L. G. Priest et al's Allison 1, c of sw¼ Sec. 52, Blk. "A", GWT&P Ry. Sur.	2238	....	....	4017	11-25-29
TAYLOR COUNTY					
Condor Pet. Co.'s F. Brookerson 1, 765 ft w and 200 ft n of sec of A. M. Boyd Sur. No. 112	1935	....	....	2504	10-10-29
Eastland Oil Co.-J. B. Dunigan's A. V. Teaff 1, 150 ft from nwc of N-109.3-ac. of 218.6-ac. tract in Willis Avery Sur.	1834	....	....	2446	7- 1-30
Magnolia Pet. Co. (was Thompson's) W. E. Hammer 1, c of n-100-ac. of Sec. 23, Blk. 19, T&P Ry. Sur.	1903	....	....	3170	8-27-29
Mid-Continent Pet. Corp.'s M. E. Cody 1, 330 ft from swc of 116.7-ac. farm, Guadalupe Co. School Land Sur. No. 120	1941	....	....	2538	9- 5-29
C. M. Root Drilling Co.'s Lon Martin 1, 990 ft e and 1650 ft n of swc of Sec. 30, Blk. 19, T&P Ry. Sur.	2001	....	....	3165	9-12-29
TERRELL COUNTY					
Mrs. Jessie B. McPhee et al's Sam Belt 1, c of Sec 78 Blk. "D-7", E. L. Ry. Sur.	1858	....	....	880	Aug. 1929
Milham Exploration Co.'s Bassett 1, c of n line of Sec. 99, Blk. "Y", W. H. Robertson Sur.	2270	....	....	5400	12- 2-29
UPTON COUNTY					
Humble O&R Co.'s R. Ricker 1-B, 1470 ft from nw and 3010 ft from ne lines Sec. 6, Blk. "R", Mrs. E. C. Grooms Sur.	2826	625	2255	2470	5-21-30
Prairie O&G Co.'s A. J. McQuatters-Upton Corp. 1, 1980 ft from w and 330 ft from s lines C. E. Dewitt Sur. Blk. "X"	2658	1415	4000	4059	10-2 -29
Texas Pacific Coal & Oil Co.'s E. V. Belcher 1, 1320 ft from n and 2310 ft from w lines Sec. 10, Blk. "4½", GC&SF Ry. Sur.	2684	1310	3620	3863	4-30-30
VAL VERDE COUNTY					
Dyar Bros. et al's W. E. Wilson 1, near c of n line of Sec. 115, Blk. "E," GC&SF Ry. Sur.	2115	....	....	3598	10-15-29
Producers Oil Co. et al's Doc Evers-Everett 1, 2310 ft s and 330 ft e of nwc Sec. 40, Blk. "D-B", CCSDR-GNG Ry. Sur.	....	....	....	2523	9-12-29
WARD COUNTY					
Continental Oil Co.'s John Sealy 2-A, 330 ft from swc of s½ Sec. 81, Blk. "A", GMMB&A Sur.	2611	1088	2280	3358	11-14-29
C. C. Dorr-Atlantic Oil Prod. Co.'s J. L. Costley-Dorr 1, 1722 ft from nw and 990 ft from ne lines Sec. 2, Joseph Howe Sur.	2493	1990	2370	2648	4-15-30
Gulf Prod. Co.'s G. W. O'Brien 7, 330 ft from swc of Sec. 22, Blk. "F", GMMB&A Sur.	2653	1610	2460	3566	3-15-30
Gulf Prod. Co.'s Wristen Bros. 3, 220 ft ne of sw line and 220 ft se of nw lines Sec. 18, Blk. 5, H&TC Ry Sur.	2511	748	2500	2545	10-11-29
L. C. Harrison-F. H. E. Oil Co.'s Will Wristen 1, 990 ft n and e of swc Sec. 26, Blk. B-28	2530	715	2590	3365	3-11-30
Mid-Continent Pet. Corp.'s J. H. Conway-Coates 1, 2316 ft from ne and 922 ft from se lines Sec. 23, Blk 29, P. S. L. Sur.	2552	880	2977	3415	2-10-30
Penn Oil Co.-Atlantic Oil Prod. Co.'s J. E. Cooper 1, 330 ft from ne and 990 ft from nw lines Sec. 43, Blk. 34, H&TC Ry. Sur.	2609	2430	2565	2880	2-16-30
Southern Crude Oil Pur. Co.'s Hill & Hill 1, 1458 ft from n and 1406 ft from e lines Sec. 30, Blk. B-19, P. S. Sur	2613	2223	2385	2970	4-5 -30
Sun Oil Co.'s Sealy Est. 1, 330 ft from nec Sec. 88, Blk. "F", GMMB&A Sur.	2680	....	....	2590	6-20-30
Shipley Oil Corp.'s Hayzlett 4, 2050 ft from se and 2420 ft from sw lines Sec. 17, Blk. 5, H&TC Ry. Sur.	2503	720	2395	3127	5-13-30
Tex.-Oil Production Co.'s Redman 1, 1980 ft from nw and sw lines Sec. 162, Blk. 34, H&TC Ry .Sur.	2717	....	....	960	4- -29
Tex.-Oil Production Co.'s Redman 1-A, lcn is 40 ft sw of No. 1 Jkd. hole	2717	1290	5037	5077	5-19-30
WINKLER COUNTY					
Kermit Dev. Co.'s J. R. Carter 1, 640 ft n and 2227 ft e of swc of Sec. 26, Blk. B-3, P. S. L. Sur.	2857	....	....	400	9- -29
Gulf Prod. Co.'s L. Daugherty 2-B, 330 ft n and 1325 ft e of swc of nw¼ Sec. 22, Blk. 26, P. S. L. Sur.	2850	1425	2495	3111	11-5 -29
Sun Oil Co.'s Sealy Est. 2, 330 ft from swc of n½ Sec. 52, Blk. "F", GMMB&A Sur.	2713	2995	3110	3288	3-28-30
YOAKUM COUNTY					
Weekly Oil Corp. et al's R. L. Knight 1, c of nw¼ Sec. 791, Blk. "D", John H. Gibson Sur.	3692	2215	....	4504	7-28-29

Sharp Decline in California Development This Year

By BRAD MILLS
Staff Representative

FIELD development in California during the first half of 1930 declined sharply from the record established during the corresponding period of 1929, curtailment and the natural drop of the critical fields having combined to check the rapid pace set with the discovery of deep zones three years ago. Field activity finally fell from its own weight, and the first six months of the present year apparently witnessed the peak of the drop. Wildcatting was affected least by the smaller amount of drilling, but perhaps fewer fields, deep zones and extensions were discovered during the past half-year than in any similar period of the past three years. Permits granted for new wells gives a fair picture of the declining activity, but drilling in the proven fields was affected more than in wildcat districts.

The new Playa del Rey (Venice) field was perhaps the most interesting area during the first half of the year. Discovered late in December by the Ohio Oil Company, this field immediately proved a sensation. Locating an oil field in mud flats was a novelty for California and the discovery changed the geology of the Los Angeles basin,—at least as far as several local geologists were concerned. The discovery well was located a short distance from the Pacific Ocean and just outside the city of Venice (Los Angeles). The immediate country was flat, having been reduced almost to sea level by overflow of the Los Angeles River. The area had been condemned by many geologists, who could see no connection between the district and Torrance, lying roughly along the same line 10 miles to the southeast.

The discovery well came in flowing 2400 barrels of heavy oil, but the fact that the crude contained a high percentage of sulphur and was not needed at this time did not prevent a rush for leases. Much of the field falls in a restricted zone, but several large leases were open to drilling, in addition to a long, narrow strip opposite the beach. The townlot nature of development was conducive to a wave of drilling and many small companies succeeded in obtaining leases and starting wells. The major companies frowned upon development of the field for a time, but gradually recognized it as a factor in production.

The main sand is found around 6000 feet and this formation was the only objective when the first locations were made. Subsequently a shallow zone at about 3500 feet was found to be commercially productive and operators have been worrying along with this sand. There is a theory that a field, to become a major factor, must have a shallow producing zone. Efforts to produce this shallow sand were all the more earnest, due to this old belief concerning certain Los Angeles basin fields. There is only the remotest chance that the shallow zone will become an important producer. Only a few wells were completed during the first half of the year. Late in the period, a 5000-barrel well was completed in the deep sand and the field began to attract wide attention. The quality of the crude and the possibility that the field would be similar to Torrance had made the area a questionable factor.

On July 1, drilling wells and active locations had increased to 30, while on July 15 the number had jumped to 50. Thus the field gradually overcame a series of prejudices and hurdled into the more active class before a large production was obtained. Completion of several large wells would result in a drilling campaign of major proportions. Assurance that the field will be a wide, flat structure paves the way for a large number of wells. The structure seems to be a broad nose anticline, with the principal producing sand in the Miocene and lying on a bed of schist. Production at Torrance is similar, but the sand there is in the Pliocene, immediately above the schist.

Great Activity Likely

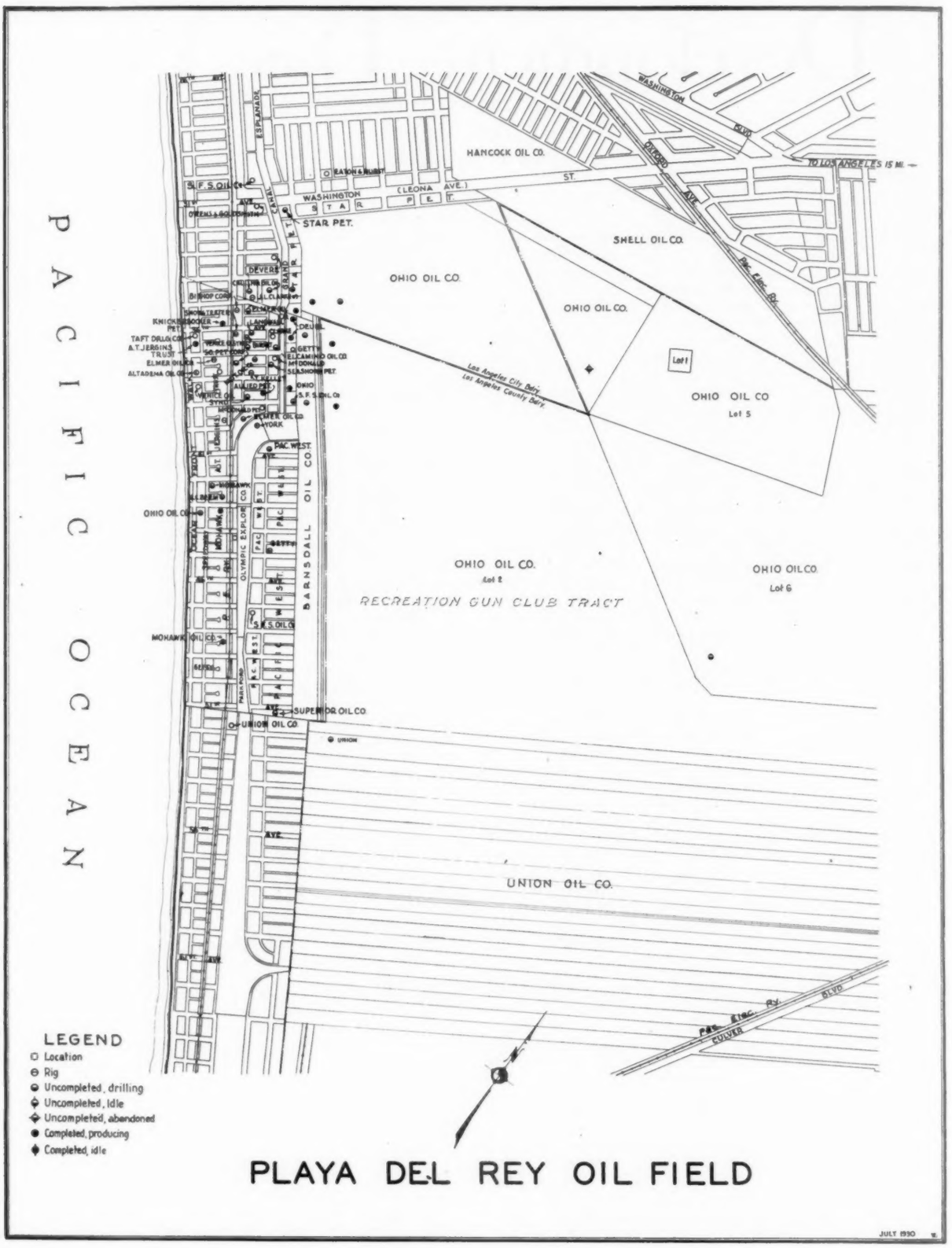
A drive to lease the townlot district and a tideland strip outside the mean high tide line was a very important development and may result in a much larger number of drilling wells than would otherwise be started. The field may extend into Venice and Del Rey and will certainly underlie the extensive unrestricted district between the two cities. Possibility of the district becoming the most active from the standpoint of drilling looms and only the completion of a few large wells is needed to double the present activity.

The sensational decline in drilling operations at Santa Fe Springs was not wholly unexpected, but the drop from 200 active tests to a mere 35 was greater than anticipated. Both curtailment and the decline of the deep zones entered into the decline in field development. At the beginning of the year, the Clarke zone still resembled a second Meyer zone and operators were engaged in a race to reach the sand. The almost sudden realization that chances of obtaining a profitable production were less than even and the advent of the curtailment program were enough to check activities. The average initial production of Clarke zone wells was a disappointment each week during the early spring months and the tendency to stop in the upper zones or plug back grew from the experimental stage to a common practice. In the absence of new locations and with the suspension of drilling in many doubtful tests, the number of active wells naturally dropped with increased completions. When development of the deep zones started two years ago, little thought was given the Meyer zone. Plugging back to this sand has been successful, however, and even the deepest well drilled in the field was able to develop into a commercial producer, after being plugged back from 9356 feet. Efforts to develop production in the Hathaway zone at various points between 8400 feet and 9000 feet were unsuccessful, but a commercial output from some point below the Clarke sand is possible on inside leases. The cost of drilling to such great depths is prohibitive where only small wells are obtained. Reworking of old wells has prevented a more serious decline in drilling operations, deepening and plugging back operations accounting for half of the activity during the past three months. There is little in sight for Santa Fe Springs during the latter half of 1930. The present level of drilling probably will be maintained but only some unexpected development can cause an appreciable increase in field operations.

Long Beach "Comes Back"

Long Beach strengthened its claim to first honors in the list of great California fields by staging another "comeback," after apparently settling down to a long, steady

decline. Discovery that the deep producing zone extends well into the Los Cerritos district, completion of several large wells in the southern and southeastern parts of the field and the success of plugging back operations were developments which could not be ignored, and at the beginning of the second half of the year, drilling wells had increased to 110—a phenomenal number for such a late stage of development. The desire of many operators to develop and hold a steady production was reflected in a steady stream of new locations. The southeastern and Los



Cerritos districts accounted for most of the locations, although good completions at various levels in all parts of the field stimulated activity. Several good wells around 5000 feet established the value of the old producing zone and the smaller expense of reaching this sand and the assurance of commercial production could not be ignored. With a producing zone nearly 4000 feet thick, this small field has yielded more commercial producers per acre than the average townlot district. The producing zone is not unbroken, but for practical purposes may be regarded as one sand. The tendency toward completion of wells at shallower depths than during the early stage of development has grown and many of the best producers of the year were finished at nominal levels. The field is the most active area in the state and probably will remain at the head of the list for at least the remainder of the year.

Activity at Kettleman Hills dwindled to a very low level, the number of drilling wells dropping to five in May. This field is potentially one of the greatest ever discovered and the lull in field development should not be taken as an indication that drilling operations will not be important. Completion of more than a dozen wells over and in the Temblor zone and the agreement not to produce them until July 1, 1931, checked drilling operations. Discovery of a slightly heavier oil far down in the Temblor zone was an important development and indicates a steadier production than could be expected from the top of the formation. Plans for a unit program of development are being drawn, with the government to be a party to the agreement. If successfully carried out, this means that the field will be drilled in a sensible manner, with the bulk of work to start some time in 1931. Development of this field is very important, due to the amount of equipment and men required, the effect of such a light crude on heavier producing districts, nature of drilling and possibility that development may get out of control because of the mixture of fee land and government permits.

Extensive drilling on tideland permits in the Pacific Ocean brought Elwood's potential production up to about 90,000 barrels. A series of large wells proved the field to lie well out in the ocean. Activity outside the mean high tide line threatened to place the field in a more critical class, but curtailment proved an effective check against intensive development. It was found that by flowing the wells through casing a much larger initial could be obtained.

North Belridge Active

Discovery that the Temblor zone in the North Belridge field contains both gas and oil was heralded for a time as one of the most important developments of the year, but failure of the well to perform satisfactorily during a production test makes the area questionable. Possibility of better production from some point deeper in the zone makes the field and general district one of the most interesting in the state. Belridge Oil Company's No. 15, the first deep test in the North Belridge field, produced 30 barrels of oil and about 3,000,000 cubic feet of gas from 5086 feet and will be deepened. If a large production of light oil is obtained, the geological map of this part of the San Joaquin valley will be changed and the Lost Hills field and other producing districts will be in line for development.

Potrero again became very active, following the discovery of two or three deeper producing sands in the Inglewood townlot sector, but a steady production could not be developed, due to the spasmodic action of the producers. This field has shown considerable promise on several occasions, but the broken conditions of the producing zones is not favorable to intensive development. About 25 wells were started in a very small area, the wide gap between the discovery sector and the townlot district remaining virtually untouched.

Elimination of Torrance as a potential deep sand producer was important and apparently removes this field from the list holding possibilities below present producing levels. Abandonment of the first deep test near the center of the field followed the discovery of schist beds—"the end of the world" so far as production is concerned.

Several wildcat areas attracted considerable attention during the first part of the year, but the value of discoveries in several districts is still in doubt. Completion of a small well near Porterville, in Tulare county, opened up a new field, but with an initial production of only 25 barrels of heavy oil and fully as much water, the new field does not threaten to become a factor in development. Several wells have been started, but drilling in this semi-proven district does not involve a heavy expenditure, the first well having been completed at 918 feet.

Point Concepcion in Santa Barbara County, the West Coyote extension, southeast Rincon extension, and several other districts were more or less in the limelight and all offer promise, but there is little likelihood of a large production from any one of the list. Standard Oil Company completed a 250-barrel well east of the producing limits of the West Coyote field, but a larger production at such a depth would be required to warrant additional development.

Drilling of Standard Oil Company's Mascot 1, a test in the Midway district, to 9629 feet, was one of the outstanding achievements of the year. This is the deepest hole in the world and is now shut down.

Expenditures for Drilling Exceed Last Year

ALTHOUGH slightly fewer wells were completed during the first six months of this year, compared with the same period of last year, there is sufficient evidence at hand to show that drilling costs increased over last year to the extent of nearly $38,000,000. Deeper drilling in the development of new fields accounts for this increase in costs.

The number of wells completed during the first six months of this year, exclusive of the Rocky Mountain area, aggregated 10,218, against 10,438 during the same period of last year. On the basis of data available on footage drilled in various sections of the country, the writer has estimated the total footage drilled in the United States during that period at approximately 39,691,000 feet, against a total footage for the same period of last year of about 33,401,600 feet. Since the average cost of materials, exclusive of labor, amounts to approximately $6.00 per foot, it is estimated that the total material cost of drilling new wells during the first half of this year aggregated about $238,146,000. This compares with a cost of $200,409,600 of material cost during the same period of last year, or a gain of about $37,736,400.

Some idea can be gained from the following analysis of footage drilled in three of the principal areas and the estimate for the United States of the increased average depth attained in comparison with last year:

Approximate Feet of Hole Drilled
First Six Months of 1930 and 1929

Area	First Six Months 1930 Average Depth	First Six Months 1930 Approximate Total Footage	First Six Months 1929 Average Depth	First Six Months 1929 Approximate Total Footage
California	6435	3,474,900	5800	3,050,800
Texas Gulf	5000	2,855,000	3500	1,652,000
Oklahoma	4000	7,008,000	2800	4,622,800
United States	3800	39,691,000	3200	33,401,600
Average Cost at $6.00 per foot		$238,146,000		$200,409,600
Increase over 1929		37,736,400		

At present rates of development, with due consideration given to a possible further slight decline in drilling, the writer estimates that about 22,500 wells will be drilled during this year, against 23,463 last year. This will involve drilling a possible total footage for the year of 85,500,000 feet, against an estimated total for last year of 75,081,600 feet. On the same basis of computation as in the foregoing the cost of drilling will approximate about $513,000,000 against about $450,489,600 during 1929. This is a net gain in cost of drilling materials of about $62,510,400.

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NORTH, south, east and west sweep the winds of heaven over land and sea, lake and forest, hill and mountain, across every barrier of the world. And, borne aloft on the wings of the Fairchild 71, man conquers those barriers just as do the winds themselves, but faster, more surely. Thus is ended the labor and delay—and peril—of trekking to remote mining and oil developments. Indeed, they are remote no longer, where it is considered that the Fairchild 71 can cover in about an hour's comfortable flight the distance of a week's hard slogging on the ground.

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FAIRCHILD
AIRPLANES

Drilling Spreading *to* States East *of* Mississippi

By W. W. MOORE
Special Representative

SHREVEPORT.—With over-production of oil facing every major area of the United States west of the Mississippi except the North Louisiana-Arkansas territory, the fact that three pools uncovered during the closing months of 1929 did not become flush areas during the first half of 1930 has not dampened exploration ardor in this territory as it might have because many operators have turned more and more to development of gas production, particularly in the upper Trinity horizon.

Zwolle in Sabine Parish, Cartersville in Bossier Parish, and Urbana in Union County, Arkansas, have not come up to what was expected of them on January 1. Zwolle has recorded 30 producers and 36 dry holes. Cartersville has recorded 41 producers and 19 dry holes. The Sarepta-Spring Hill district which is five to six miles east of Cartersville but produces from the Blossom while Cartersville's yield is from the Woodbine, has added 14 producers, practically carrying a heavy salt water content, five gassers and four dry holes. Of 12 tests drilled in Urbana, where production is obtained at a possible contact of the upper and lower Cretaceous or the lower Woodbine, only three have been producers, each of them having 50 per cent or more salt water content.

Zwolle's Production

Zwolle's production so far has been limited to the Nacatosh, Marlbrook marl, and Annona chalk, which for operating purposes is referred to under the name of "Zwolle chalk rock". Only one well, the discovery well of the field completed Thanksgiving Day, 1928, as a 50-barrel flowing well, was in the Nacatosh, the remaining wells there having been obtained either in the marl or chalk in depths ranging from 2200 to 2650 feet.

As has been indicated from the record of Zwolle the chalk rock production has been erratic. The field might still be classed as a wildcat area for dry holes offsetting good producers and vice-versa has been the history of the field. There has been little salt water in tests which did not penetrate the Blossom which underlies the chalk and is notorious in Zwolle for its salt water. Roughly Zwolle is 17 miles in width from east to west and roughly half a mile wide from north to south. However, there are non-productive intervals between. For example from the original west Zwolle area centered in Section 14-7-14 there is a nine-mile non-productive interval to the Zwolle townlot producers.

Townlot drilling followed a three-mile western link completed in the marlbrook marl by Lion Oil Refining Company and associates in Sabine Lumber Company 1 in Section 31-8-12. For some time tests between the east border and the townsite failed to get production. Then a mile west of the east border a producer was added, and later a mile further west another well came in.

The high part of the Zwolle formation is presumed to lie between Zwolle townsite and Blue Lake. However, one test drilled in that general vicinity by Ohio Oil Company failed to get production in the chalk. R. L. Gay and Walter E. Cooke, discoverers of the field, and pioneer operators in that territory, plan an exploration campaign soon in this nine-mile stretch. They have a 20,000-acre block checkerboarded from Zwolle townsite to Sabine River, the Texas border, a distance of 15 miles.

No Failures at Zwolle

Loring Oil Company, which acquired 10,000 acres and the discovery well of the Zwolle east field, from Cooke and Gay, have yet to record a failure in 10 tests drilled to the chalk. This company is doing pioneer exploration work in seeking a lower pay horizon. One test in the Zwolle east field, Bowman-Hicks 5, Section 34-8-12, is below 4000 feet. Another test six miles southeast of production in the Blue Lake area will go to 6000 feet unless pay is encountered above. This test is around 4200 feet. Formations are running about 800 feet lower than in the Zwolle east field. Toteco Oil Corporation, four miles east of this 6000-foot test, Peavy-Wilson 1, Section 21-6-13, is at present getting gas shows in a line formation just above 4100 feet in Louisiana Long Leaf Lumber 1, Section 18-6-12.

While the Zwolle chalk rock still presents a problem it

Traveling Editor

"I would certainly like to have the job of that man Leigh," several friends have remarked to us recently with reference to the work which Roy E. Leigh, Associate Editor of THE OIL WEEKLY, *is doing in foreign oil fields.*

And sometimes we think we would, too, and then again, we sometimes are inclined to let Leigh have the job without protest.

Last year he travelled more than 30,000 miles in South America, visiting practically every spot where oil was produced on that continent. His travels took him through the jungle, over the highest mountains on the Western Hemisphere, into desert country—in fact, wherever the drill was searching for oil.

The beginning of 1930 saw Leigh "taking off" for the remaining oil fields of the world outside of the Western Hemisphere. The Continent, Egypt, Mesopotamia, Persia, Russia's Asiatic properties, India, the West Indies, Japan—all these are on his itinerary.

Who is Leigh? He is a man who has spent practically all of his adult life in the oil business. He has served the industry as field man, as superintendent, as office man and finally as executive. He is a man whose qualifications include everything necessary to make a good "travelling oil editor," a man who observes and who transmits to those he visits as much information as he receives. He is employed exclusively as associate editor of THE OIL WEEKLY.

At the International Petroleum Exposition in Tulsa last October his meeting of oil men from South America who he had met in office and jungle was a constantly recurring incident—and he knew them all by their first names.

Roy Leigh is a "regular fellow" who we are proud to have represent us in his travels through the foreign oil fields of the world.

Publisher THE OIL WEEKLY.

is generally conceded that the major pay zone lies below the chalk. Evidently the oil coming from below is not from the Blossom. It is thought may come from the Woodbine or Trinity. It likely comes up in a fault and spreads through breaks in the chalk.

Cartersville was originally a gas field in the 3000-foot zone. In 1929 oil was discovered at 3164 feet and since that time it has been found that there are various stray sands in the Woodbine of that area, some production having been obtained as low as 3200 feet. The sand is lenticular. Roughly, production has been fairly well-defined as situated in Sections 30 and 31-23-11 and in Sections 25, 26 and 36-23-12. Sarepta-Spring Hill's Blossom sand horizon so has been confined to wells in Sections 1, 2 and 3-22-11 and Section 36-23-11. Almost all the wells have more salt water than oil in the initial yield. The majority of the wells are pumpers.

The Urbana district of Union County, Arkansas, was uncovered by Marine Oil Company in Thompson A-3, Section 10-18-13, at a depth of 3535 feet. All three producers are in that section. The discovery well under air pressure is flowing 7000 barrels of fluid daily, 86 per cent salt water and basic sediment. This is Arkansas' deepest production. Urbana was also originally a gas field in the 2700-2800-foot zone having been uncovered as a gas area in 1926. Salt water encroachment subsequently ruined the gas production.

Holly at 2800 Feet

The Holly field of DeSoto Parish where pay is encountered in the Woodbine at a depth of 2800 feet was uncovered during 1930 as an oil producing area. A gasser was completed in Fuller 1, Section 6-13-13, by R. O. Roy in August, 1928. Two subsequent tests were failures. Then Roy's Farmer E-1, Section 5-13-13, was completed as a 2500 barrel flowing well. This well has fallen to a yield of 400 to 500 barrels daily. The other three producers are in the same section. The limits of the field now fairly well defined show it to be small, although a 40,000,000 foot gasser was obtained in the Woodbine three miles to the southwest by Odel and Lawton working over an abandoned test, Harris 1, Section 11-13-14. The test was plugged back to the Woodbine horizon from total depth of 3140 feet. Fifteen tests around the oil producers have been mainly salt water holes, with three small gassers.

Gas development in the upper Trinity in two areas has opened the most optimistic avenue of development in North Louisiana and South Arkansas during the current year.

Triangle Drilling Company with which are associated Standard Oil Company of Louisiana and Louisiana Gas and Fuel Company, on an 8500 acre block in the Sugar Creek district of south Claiborne Parish, Louisiana, 18 miles southeast of the old Homer oil field, have completed two commercial gassers in oolitic lime in the upper Trinity at the 4300 foot horizon. The gas which runs from 793 to 1350 gallons per 1,000,000 cubic feet in gasoline content was obtained after a campaign in which eight tests were drilled.

The first of the two gassers, Kilpatrick 1, Section 7-19-5w, was completed as a 2,000,000 foot gasser with a spray of heavy oil. The second gasser, Caskey 2, Section 6-19-5w, gauged over 19,000,000 cubic feet without oil. The entire block will be drilled with one test to every 40 acres as a start, as developments warrant. Plans are already under way for a gasoline plant in the field and the gas is convenient to a trunk gas line extending from Monroe, Louisiana, to Shreveport.

Find Gas in Trinity

Another field opened as a potential Trinity horizon gas producing area is the old Bethany gas field of Panola County, Texas, which borders the Louisiana line and extends over into Caddo Parish, Louisiana. Natural Gas Production Company's Roquemore 8, in the B. C. Jordan Survey, was completed in the 4500-4600 foot horizon as a 10,000,000 to 15,000,000 foot gasser. No test has been made of the gasoline content but it is believed to be high. A southern offset, Tom Moore 3, is now below the 300 foot level. Bethany has gas production at the 900-1000 foot, 1900-2000 foot, 2300-2400 foot, 2700-2800 foot, and 2900-3000 foot level, and in the Trinity.

Another gas field either in the Fredericksburg or upper Trinity has been in development during 1930. This is on the southwest flank of the old shallow Bellevue structure where oil production in the Nacatosh was obtained at the 300-400 foot level. H. I. Morgan and Shreveport-El Dorado Pipe Line Company now have two gas producers in the 1800 foot horizon as the result of an exploration campaign on this Bellevue flank. Three other tests there are now under way.

Trinity horizon development in this territory received its first impetus in this territory in 1924 when Dixie Oil Company completed a gas well rich in gasoline at the 3600-foot level in Pine Island in the Glen Rose. Subsequently considerable oil was obtained in the upper Trinity from 3600 to 4000 feet but salt water encroachment halted further development in that horizon.

One oil well completed in the Trinity in the 4500-4600 foot horizon several years ago in the Haynesville field of Claiborne Parish has not been joined by any companion producers at that level at that field although this test is still making a few barrels of oil daily.

Cotton Valley's Trinity gas producing horizons at the 4400-4800 foot zone apparently have been pretty well defined. There are a number of stray and lenticular sands in this horizon, which were made the study of J. S. Ross, formerly with the United States Bureau of Mines, whose bulletin on this subject is now on the press. Ross was succeeded here by T. J. Heithecker of the bureau who is making a special study of the Zwolle field and probably will issue a bulletin thereon.

Lower Trinity at Cotton Valley

Cotton Valley, when the need for deeper oil production in this territory demands it, may be able to furnish such yield from the lower Trinity. Magnolia Petroleum Company's McCook and Hibbler 1, Section 22-21-10, drilled to total depth of 7002 feet before being abandoned, this being the deepest test ever drilled in North Louisiana or Arkansas, had an oil core of 11 feet of sand around 6950 feet, but salt water which may have leaked in from above, later caused the well to be abandoned.

Another gas field which indicates a potential area of some magnitude developed into a commercial area is the Lake Bistenau field of Bienville Parish, Louisiana. A few very small gassers have been completed there for several years but during the summer Arkansas Fuel Oil Company has completed a 41,000,000 foot gasser in the Woodbine and a small commercial gasser in the Blossom, indicating both zones are of commercial value. The formations correlate with the Elm Grove and Sligo gas areas in Bossier Parish, approximately 20 miles to the west.

A shallow gas field in Pope County, Arkansas, at a depth of 1400-1500 feet was uncovered during the year by Arkansas Louisiana Pipe Line Company. Two commercial gassers have been completed in that area to date.

During the first six months of 1930 there were 140 producers with an initial yield of 29,903 barrels completed in North Louisiana and the border counties of East Texas. In the same area for the same period there were 133 gas wells with a combined initial yield of 2,260,750 cubic feet of gas and 135 failures. In Arkansas there were 58 producers completed with a combined initial of 2532 barrels; eight gas wells with a combined initial gas yield of 41,500,000 feet; and 39 failures. In Mississippi there were two gassers with a combined initial yield of 30,000,000 cubic feet and five failures. Alabama recorded one failure for the half year. The combined new production statistics for these areas show 198 producers, combined initial yield 32,335 barrels; 143 gassers with combined initial of 2,332,500 cubic feet; and 180 failures.

Workovers Feature Smackover

Workovers in Smackover have furnished the bulk of new yield in Arkansas during the semi-annual period. As there

are four producing sands in parts of that field, perforation of casing above the horizon in which the well was first completed and which may have become depleted, often gets good results. The Nacatosh is found at the 1900-2000 foot zone. Below that in place of a chalk rock are found sand bodies that yield oil. The Meakin sand is found around 2200 feet, the Graves at around 2400 feet, and the Blossom around 2600 feet with stray sands in some sections of the area that cannot be identified as Woodbine. While perforations get oil production ranging from five to 40 barrels, the yield is usually accompanied by much salt water. Only in the northeast part of the field has there been new development of consequence. This has been largely in Section 27-15-15. Heavy Smackover's daily production is now around 35,000 to 37,500 barrels daily while light Smackover's daily runs are slightly above 5000 barrels. The daily average per well in Smackover is becoming decidedly small, especially in the Louann sector where it runs slightly above five barrels per well.

Undoubtedly repressuring will be resorted to soon in sections of Smackover. Deep drilling will also be used as the Trinity is yet unexplored in that region and the Woodbine has had few tests. Crawford and Sebastian have blocked acreage in township 16, range 16, Union County, for two tests that are deep for that area, one to 3200 feet and the other to 4500 feet.

Use of the repressuring in North Louisiana, and South Arkansas will be accelerated soon as a repressuring project is now being put into effect in the Haynesville field of Claiborne Parish, Louisiana, where pay was obtained in the Blossom. Starting out with 13 key wells, one key well to nine tests having been drilled mathematically in that field, four to every 40 acres, the fluid level has already been raised more than seven feet and 15 more key wells were recently authorized as a conference of officials of Louisiana Oil Refining Corporation, Ohio Oil Company, and Reserve Petroleum Company, which are cooperating in the repressuring.

Oil in storage in North Louisiana as of July 1 consisted of 11,378,455 barrels in steel storage and 319,325 barrels in earthen storage. In Arkansas 8,696,725 barrels were in steel storage and 1,325,678 barrels in earthen storage. On May 1 North Louisiana oil in storage including both steel and earthen storage was 11,138,704 barrels, and in Arkansas 12,486,159 barrels.

Jackson Critical Field

The most critical field in this territory at present is the Jackson, Mississippi, gas area, where as of July 15 there were five commercial gassers, not including one carried as a 2,000,000 foot well which showed much salt water and is supplying a nearby test with gas fuel. The daily potential gas yield of the Jackson field is in excess of 100,000,000 cubic feet daily. The gas is obtained at the 2400-2500 foot zone in midway or Selma chalk. The gassers are divided between Hinds and Rankin counties and are within a few miles of the state capital, some of the gassers being within the city limits of Jackson. While spasmodic wildcatting had gone on around Jackson for several years a 4000-foot test drilled by Lion Oil Refining Company and several other major companies in Misterfeldt 1, in Rankin County, 15 miles south of Jackson, about two years ago started the present campaign. This test, while a failure, furnished valuable geological data. In the summer of 1929 Home Oil Producing Company, drilling Rainey 1, Section 13-5-1e, Rankin County, just east of Pearl River, the border between Hinds and Rankin Counties, encountered a gas blowout at 2508-12 feet at the top of the Midway-Selma chalk. Returns were lost and the well finally abandoned. Gulf Refining Company subsequently took over 7000 acres from this company and has completed its Rainey 1, a quarter of a mile from the original test, as a commercial gasser after plugging back to 2500 feet at top of the chalk. Louisiana Gas and Fuel Company, Carter Oil Company, and Ohio Oil Company are among the major companies now in the Jackson field where there were on July 15 18 tests under way, counting derricks up.

Amory Was First Gas Field

Jackson was not the first commercial gas area in Mississippi. That honor rests with Amory, a town in Monroe County, northeast Mississippi, where a 5,000,000-foot gasser was completed five years ago

A show of heavy oil of 13.2 gravity was found in Gulf Refining Company's Rainey 1 at Jackson. The following is an analysis of the gas from Love Petroleum Company's Mendoza 1, Section 12-5-1e, Hinds County, a 28,000,000-foot gasser and the first large one completed in the Jackson area:

Oxygen, 0.46 per cent; carbon dioxide, 0.34 per cent; methane, 99.0 per cent; Nitrogen, 0.21 per cent.

Much geophysical work has been done in Mississippi and west Alabama especially on the Hatchitigbee anticline in east central Mississippi and west Alabama.

One of the important wildcat developments of the six months period was a gas blowout estimated at 6,000,000 to 10,000,000 cubic feet in A. C. Glassell and associates' Pittsfield Plantation 1, a wildcat in Section 41-8-10e, Concordia Parish, Louisiana, just across the Mississippi River from Natchez, Mississippi. This was in the Claiborne at a possible juncture of the Jackson Yegua and Wilcox. It has started a geological and geophysical campaign across central Louisiana extending into southeast Texas and southwest Mississippi. Both the Urania oil field of LaSalle Parish, Louisiana, 50 miles northwest of Glassell's test and the Nacogdoches County, Texas, field are Wilcox pay zones. Urania as well as the Concordia Parish test is just south of the Angelina-Caldwell Flexure or southern boundary of the Sabine-Monroe uplift. Glassell and Louisiana Gas and Fuel Company have more than 200,000 acres between them in Concordia and southwest Mississippi. Glassell has already started two southwest Mississippi tests on the strength of Pittsfield Plantation 1.

The Monroe and Richland gas fields of northeast Mississippi are the center of a network of interstate gas lines. Four of the main trunks radiating from these areas are Mississippi River Fuel Oil Corporation's line to St. Louis, Southern Natural Gas Corporation's line to Atlanta, Georgia, and intermediate points, Memphis Natural Gas Company's line to Memphis, Tennessee, and Arkansas Natural Gas Corporation's line to Shreveport, Latex and Texas points. Southern Natural Gas Corporation's line to Atlanta was completed early in 1930. Other gas line construction this year in North Louisiana and Arkansas has been confined to small lines to small cities, laid by Arkansas Natural Gas Corporation either from its own lines or from Mississippi River Fuel Corporation's trunk line to St. Louis. Two short oil lines were laid or are being laid, Standard Oil Company of Louisiana's four-inch line from Urbana to El Dorado, Arkansas, and a similar line from Haynesville to Cartersville, Louisiana.

Monroe, with over 500 gas wells producing and Richland with over 200 gassers with approximate open flow capacity of 4,000,000,000 and 2,500,000,000 feet daily, respectively, furnish plenty of potential supply for gas lines.

Oil Weekly and Foreign Fields

For some time THE OIL WEEKLY *has led by a wide margin all oil papers in circulation in foreign oil fields. While the latest figures are not available at this moment,* THE OIL WEEKLY *probably leads its next nearest competitor in foreign oil producer circulation by around 50 per cent.*

The reason is obvious. Not only does THE OIL WEEKLY *specialize in oil production and pipe line editorial matter, thus saving the producer or pipe line man the trouble of wading through a mass of unrelated matter to get at what he wants, but* THE OIL WEEKLY *has gone to the trouble and expense of keeping an editor travelling in foreign oil fields and its weekly feature on foreign operators gives recognition to what is going on abroad.*

Over Production Intensified by Increased Efficiency

(*Continued from page 60*)

an unfavorable influence upon the natural gasoline situation. This is a matter that must be given consideration by that branch of the industry and some effort must be made to either convert a part of this product to other uses, or endeavor to create a larger market for a strictly aviation grade of gasoline.

Picture Much Confused

A comparison of pertinent facts on the oil situation, as revealed by the results obtained during the first half of this year against the same period of last year presents a rather confusing picture. On the one hand, the facts show decided improvement from a demand standpoint, while on the other hand the picture is most unsatisfactory from an operating and supply standpoint. With all of the curtailment measures in force this year, production of crude has slightly exceeded the rate attained last year. However, in view of the fact that last year's production surged sharply upward during the summer months, reaching its peak in August, while the trend this year has turned sharply downward, is one encouraging turn in the situation. The facts presented in Table 5 emphasize a number of unfavorable factors that have an important bearing upon the immediate future of the industry. For example, it is shown that drilling has not subsided to any degree, while the recovery of crude per well has materially increased, augmenting the potential supply of oil. Similarly, the rate of revovery of gasoline per barrel of crude refined has increased to an appreciable extent; in fact, more than had previously been realized as a possibility. Gasoline imports have increased 134 per cent over last year, another factor that is exerting an unfavorable influence upon the supply situation.

Both the crude supply and the gasoline supply, measured in days of consumption, have shown material gains. The natural result of all this has been a weakened market structure for both crude and refined oils. The comparison of crude prices and wholesale price of gasoline reflects the unsatisfactory conditions revealed by the supply and demand figures. Other figures, equally impressive, could be cited to show the unfavorable picture confronting the industry this year, but it is believed that those shown in the accompanying table represent a composite view of the general situation.

No Let-up In Drilling

In another section of this issue there is presented a complete report of oil field operations for the first six months of this year and last year reveals that while there was a last year. This shows completions, producing wells, gas wells, failures and initial oil and gas production for every field in the United States, with the exception of the Rocky Mountain area. Considering the number of new areas developed toward the latter part of last year and thus far this year, it is not surprising to note that there was practically no let-up in drilling. Well completions for the first six months of this year were 10,218 against 10,438 last year. Of this number, 5,835 were oil producers, against 5,798 last year. Of particular significance is the fact that initial oil production showed a material gain over last year. Results for the first six months of this brought in 4,336,419 barrels of new (24 hour) production, against 3,745,410 barrels for the same period of last year. This indicates that the initial production per well has increased from 646

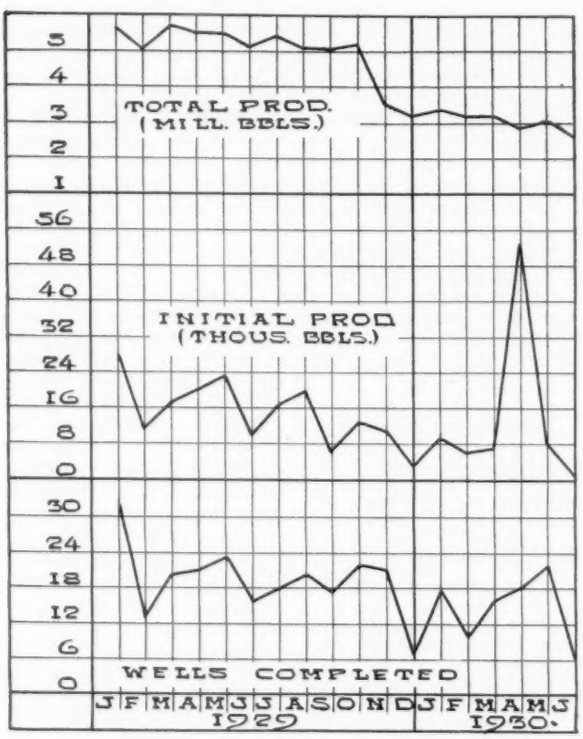


FIGURE 12
Field development of Long Beach and Signal Hill, California

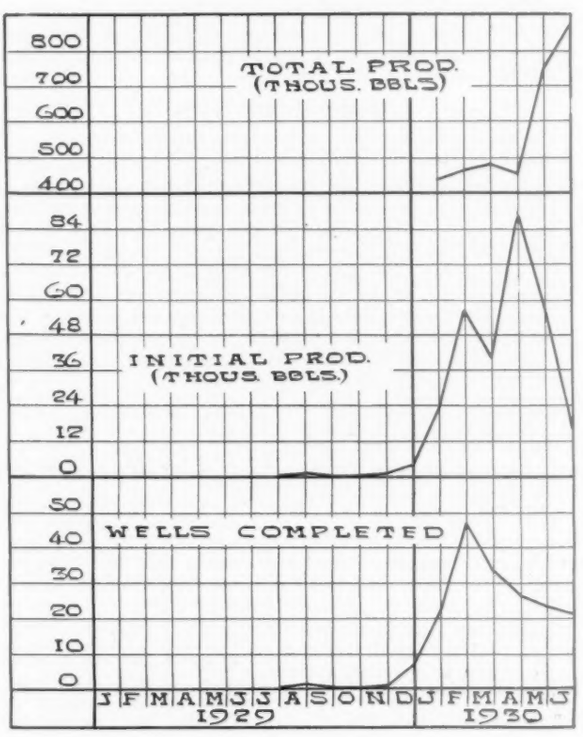
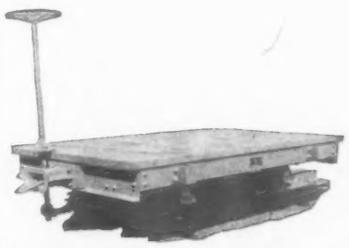


FIGURE 13
Field development of the Darst Creek area, Guadalupe County, Texas

Easton Cars Carry *the* Burden of Foreign Oil Operations



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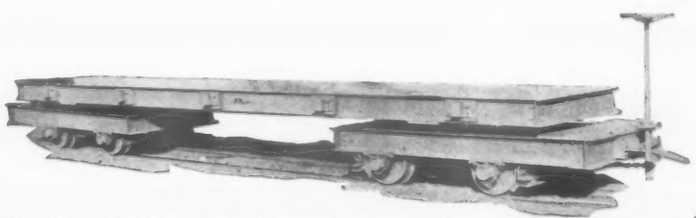

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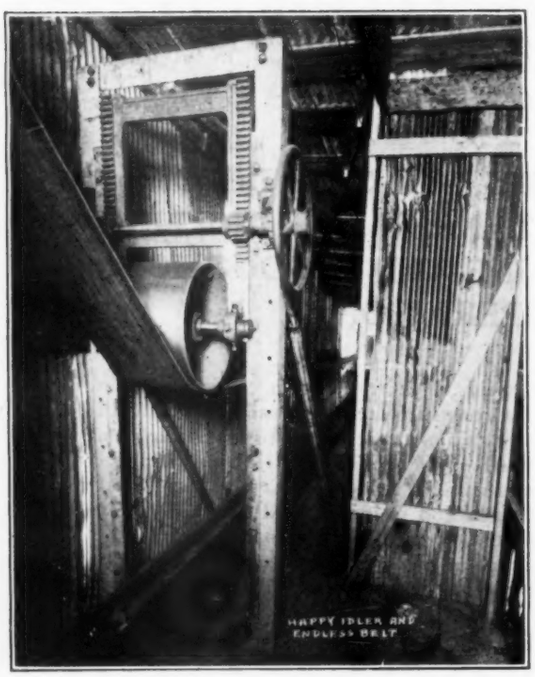

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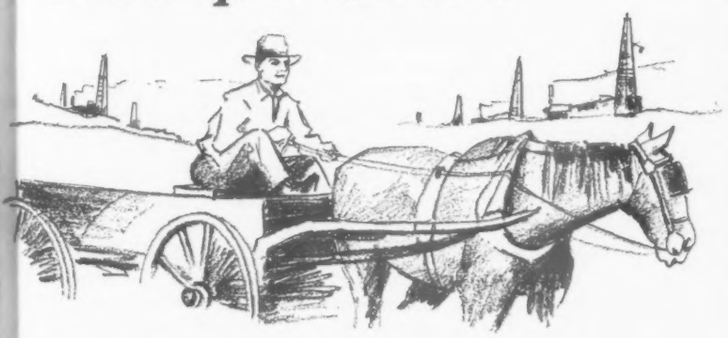
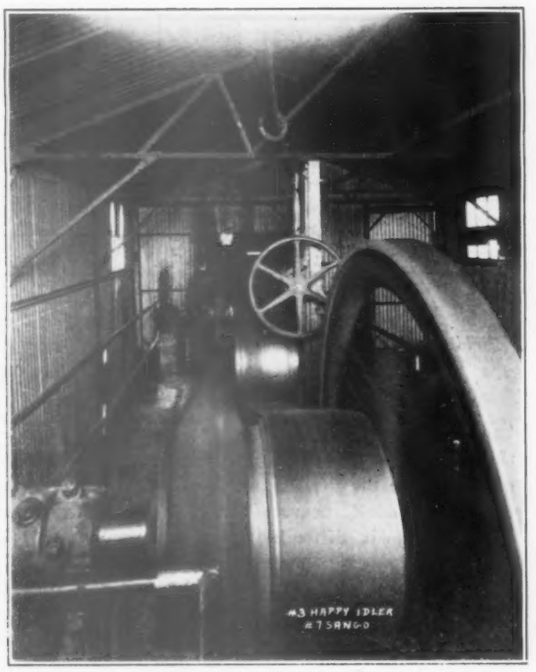


So why **waste time and continue to use belts with mechanical fasteners?**



E-C (Engine to Countershaft) Vertical Belt Tightner

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Belts are saving money for

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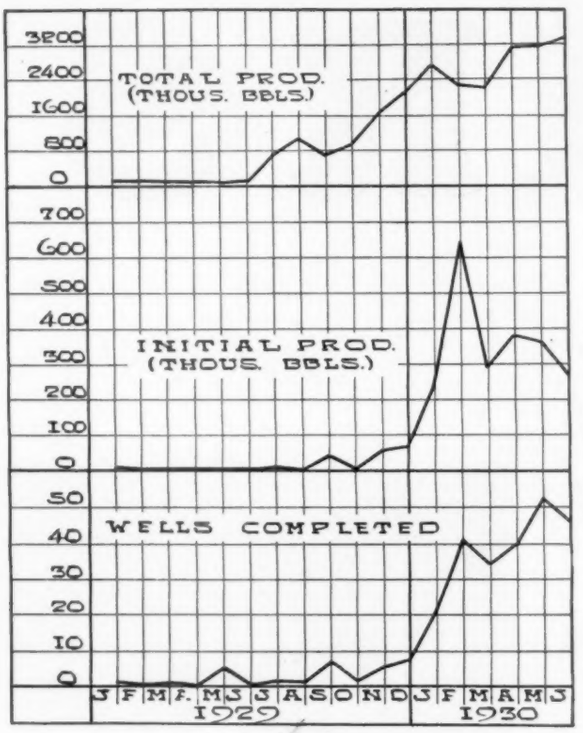

FIGURE 14

Field development of Oklahoma City pool, Oklahoma County, Oklahoma

barrels during 1929 to 743 barrels during the first half of this year. The productivity of the newer areas under development since the first of the year has materially augmented the underground reserves of petroleum to such an extent as to make it difficult to maintain a normal rate of production.

A comparison of total oil production for the first half of this year and last year reveals that while there was a slight increase in total production of the United States, material declines were recorded in some areas. Oklahoma produced a total of 118,993,060 barrels during the first half of this year, against 121,432,370 barrels during the same period of last year. California produced during this period 119,899,600 barrels of crude, against 141,054,450 barrels last year. Incidentally, California led all states in total quantity of oil produced during this period, closely followed by Texas. Final results for this year will undoubtedly place Texas first as the largest producer of crude oil in the United States. Texas, Kansas, Gulf Coast, North Louisiana, Eastern and Rocky Mountain states reported increased production during the first half of this year, compared with the same period of last year. Texas reported the largest gain, from 108,544,400 barrels in 1929 to 119,546,410 barrels this year.

Changes Were Important

The accompanying charts, Figures 3 to 15, present a graphic view of the important changes that have taken place during the past 18 months. Such fields as Oklahoma City, Seminole, Refugio, Van Zandt, Winkler County, Yates, Long Beach and Santa Fe Springs, have made history in the industry during the past year and a half. In the newer areas, drilling activity has been accelerated to a marked degree, resulting in a flood of new oil production such as has never before been witnessed. In older areas, natural declines in productivity have prescribed sharp downward trends that would ordinarily have created a flurry in the crude market. Table 6 focuses particular attention upon a number of the leading oil pools, showing the rise or fall in drilling activity and consequent increase or decline in new oil production obtained. Most remarkable in this array of oil field activity is the phenomenal rise to fame of the Oklahoma City field. Here the number of well completions had risen from a mere seven well completions in 1929 to 237 in 1930, while initial oil production surged upward from only 6565 barrels in 1929 to 2,228,328 barrels this year. On the other hand, Winkler County, Texas, well completions have shown a decline from 139 wells in 1929 to only three wells in 1930, while initial oil production has declined from 99,505 barrels last year to only 1090 barrels this year. All of the fields listed and charted present a picture that has a special significance to the producing branch of the industry at this time.

Production Control Needed

The foregoing facts cannot fail to emphasize the urgent need for stringent measures of production control during the balance of this year. All of the facts studied can be boiled down to one figure for the producer and one for the refiner. The producer must not allow the production curve to exceed 2,390,411 barrels daily during the balance of this year; the refiner must not allow still runs to exceed 2,570,000 barrels daily during the same period. Then, too, in order to maintain a close degree of stability between these two branches of the industry imports of crude must not exceed the contemplated figure of 163,500 barrels daily over the balance of this year and the importer of gasoline must either reduce receipts from foreign sources, or the refiner will be obliged to further curtail still runs to offset any gain in supply from this source. The producer cannot overlook the refining situation as a direct influence upon his own market situation. If any advances in the crude market are justified during the balance of this year, it will be because there has been satisfactory improvement in the refining situation.

It is apparent now that a great many refiners, particularly those that must buy crude in the open market, are facing a grave situation that is turning former profits into losses. At present market prices for gasoline and other refined products, many refiners are unable to show a profit from their operations. This, combined with a continued over-supply of crude, has placed the crude market in a rather precarious position during recent weeks. The producer has realized the possibility of a further decline in the crude market while the refiner has also realized the consequences of continuing to run crude to stills at an abnormal rate. The result has been a better understanding on the part of both, an understanding that may prove as a preventive of a generally lower oil market. With the refiner taking definite steps to reduce the over-supply of gasoline and further curtailment action being promulgated in producing circles, it begins to look as though the constructive steps being taken will result in a favorable turn in the economic situation before the end of the year. It is unfortunate that constructive action has been so long delayed as to prevent needed market improvement at the height of the consuming season, but it is fortunate that results are actually being accomplished now that offer a brighter outlook for the future. If producers and refiners carry out proposed curtailment measures throughout the balance of this year, it is possible that stocks of both crude and refined oils will show a material reduction by the end of 1930.

CHANGING TIMES...

Methods of recovering and treating oil are ever changing. The industry has been revolutionized by improved production, transportation and refining processes. Science has brought forth new devices to replace the old.

To keep up with the times the oil man and all other business men must be alert, foresighted and constantly adapting themselves to changes. Modern banks must keep step with the development of modern business.

New methods often require new types of financial service. The up-to-date bank of 1930 offers its customers every financial and fiduciary service, each given by trained and experienced specialists all subject to uniform general direction and policy.

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Resources More Than 70 Million Dollars

The FIRST NATIONAL BANK
AND TRUST COMPANY
Of Oklahoma City

1ST Since 1889

What Constitutes Safe and Sane Stocks of Petroleum
(Continued on page 55)

crude stocks, there is absolutely no reason for having more than 100,000,000 barrels in the entire United States."

Somewhat contrary to the opinions quoted in the foregoing are the comments received from Edward T. Moore, president of Simms Oil Company, Dallas, Texas:

"Personally, it does not seem to me that a gasoline stock equivalent to 46 days' current consumption should be considered as at all excessive and, similarly, a stock of crude petroleum above the ground equivalent to 205 days as a normal supply is not at all out of proportion, when one considers the conditions applicable to the petroleum industry.

"If it were not for the fact that we have potential production in excess of our present daily requirements, it would be very easy to find many qualified people in the industry who would be ready to raise the cry that our crude oil would in the course of a few years be exhausted. It seems to me that it was only a matter of five or six years ago that quite a number of authorities in the industry were raising the same hue and cry. It is quite within the range of possibility that another year or two may see an entirely different situation from that which we now face.

"I am not an advocate of large refinery stocks of gasoline. Nevertheless, I feel that 40 to 50 days' supply is not an altogether unreasonable quantity for refineries to have on hand."

No Refinery Reserve Needed

One significant and weighty remark made in a letter received from Honorable Ray Lyman Wilbur, of Washington, D. C., is quoted as follows:

"With the recent record before us of building up, in a few weeks, the unneeded stocks of gasoline, there would seem to be little ground for fear that the refinery capacity of the country needs a large reserve to assist in meeting the peak demand, the extent of which can be closely forecast. With the large surplus capacity at both well and refinery, large stocks are an unnecessary financial burden. Balancing supply with demand is the outstanding economic task before the oil industry."

From the data assembled, including some of the comments received from leaders of the industry, it is obvious that the petroleum industry cannot afford to continue to carry present large inventories of crude and products. The facts available offer conclusive evidence that there is an excessive and unnecessary supply of crude oil and gasoline in storage. It is therefore obvious that any consideration of the over-production problem must include the all-important factor of inventories, particularly the above-ground supply of crude and the refinery stocks of gasoline. It is not enough to balance the supply of crude oil and gasoline with current market requirements; it is necessary also to consider the stored supply of these commodities, in order to insure the maintenance of normal inventories as a reserve against day-to-day demand. As long as stocks of crude and gasoline remain at their present excessive levels, that long will the industry be faced with an uncertain market situation. When these stocks have been reduced to the normal basis of 30 days' supply of gasoline and 106 days' supply of crude the industry will again function as a rational unit in the industrial world. Just as it has been found possible to control crude production and refinery runs, so it will also be found possible to control the stored supply of these commodities.

Review of Crude Price Changes, First Half of 1930

January 15—Humble Oil and Refining Company reduced all grades of crude purchased in Texas from 25 to 41 cents a barrel.

January 15—The Texas Company and Humble Oil and Refining Company posted reductions on all grades of North Louisiana crude.

January 16—Standard Oil Company of Louisiana posted reductions on all grades of crude purchased in North Louisiana and Arkansas.

January 16—Carter Oil Company reduced all grades of Mid-Continent crude from 24 to 41 cents a barrel.

January 17—Louisiana Oil and Refining Company and Atlantic Oil Producing Company posted reductions on all grades of Louisiana and Arkansas crude.

January 17—Magnolia Petroleum Company posted reductions on all crude purchased in Oklahoma, Kansas and Texas, meeting schedules placed into effect by Carter Oil Company and Humble Oil and Refining Company January 16, 1930.

February 15—Crude oil prices were made uniform in Oklahoma and Kansas by the adoption of Carter Oil Company schedule by all purchasing companies. Sinclair Crude Oil Purchasing Company adopted the new schedule of prices on February 13, followed on February 15 by Prairie Oil and Gas Company and all other purchasing companies.

February 15—Ohio Oil Company reduced market price of Lima, Indiana, Illinois, Princeton and Wooster crudes 15 cents and Western Kentucky 18 cents a barrel.

February 15—Ohio Oil Company reduced Elk Basin and Grass Creek, Wyoming, crude 20 cents a barrel; Big Muddy crude 10 cents, and Artesia 8 cents a barrel.

February 15—Canadian crude was reduced 15 cents a barrel.

February 17—All grades of Pennsylvnia oil reduced 25 cents a barrel.

March 11—Standard Oil Company of California posted advances on all grades of California crude from 1 to 25 cents a barrel, reinstating schedule in effect prior to November 8, 1929.

April 1—Humble Oil and Refining announced first posting on Refugio crude; heavy, below 25 gravity, 75 cents a barrel; light oil, same posting as Gulf Coast Grade "B" on 25 gravity and above.

April 10—Humble Oil and Refining Company posted increases of from 5 to 13½ cents a barrel on all grades of Texas and New Mexico crudes. This advance was met by all purchasing companies.

April 10—Magnolia Petroleum Company posted increases of from 4 to 13 cents a barrel on all grades of Oklahoma, Kansas and North and Central Texas crudes.

April 11—Standard Oil Company of Louisiana posted increases for Caddo, Homer, Haynesville, Bull Bayou, Sabine, Crichton, DeSoto, El Dorado and Smackover crudes. The advances ranged from 10 to 13 cents a barrel for North Louisiana and Arkansas crudes; and 10 cents on Coastal Louisiana and Texas oil.

April 11—Ohio Oil Company posted increases for Lima Indiana, Illinois, Princeton, Plymouth, Wooster, Western Kentucky, Elk Basin, Grass Creek Big Muddy, Lance Creek, Rock Creek and Artesia crudes.

April 11—Petrolia and Oil Springs, Canada, crude prices were advanced 5 cents a barrel.

May 1—All Pennsylvania oil reduced 25 cents a barrel.

May 2—Corning crude advanced 10 cents a barrel by Joseph Seep Purchasing Agency.

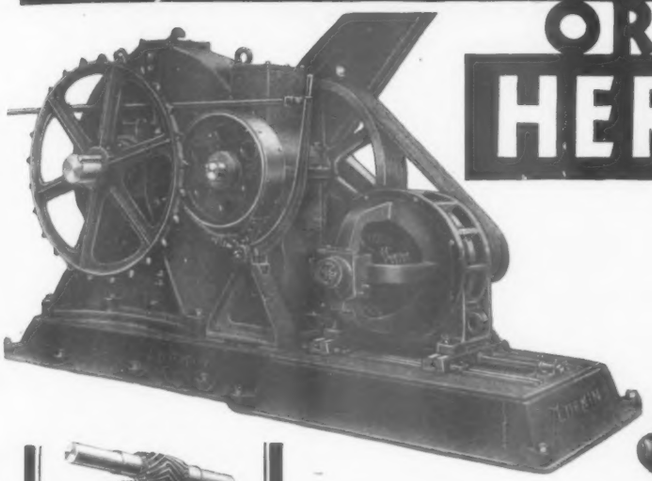
May 16—All Pennsylvania crude reduced 25 cents a barrel.

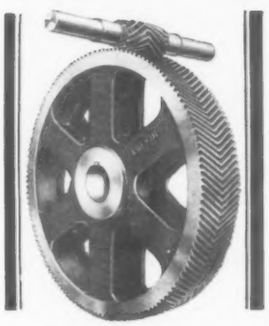
May 17—Standard Oil Company of California reduced Santa Fe Springs crude from 75 to 90 cents barrel, making 21 to 27.9 gravity oil 50 cents a barrel and 35 and above 95 cents a barrel.

June 14—Standard Oil Company of California posted increases of from 75 to 90 cents a barrel on Santa Fe Springs crude, restoring schedule in effect prior to May 17, 1930.

June 17—All grades of Pennsylvania crude reduced 10 cents barrel; Buckeye, Ohio, reduced 5 cents and Bradford and New York Transit crudes reduced 15 cents a barrel.

WORM GEAR OR HERRINGBONE?





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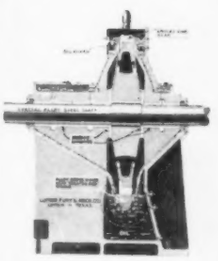

Cross section Lufkin Worm Gear

BLONDE OR BRUNETTE?

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Lufkin Worm Gear type Units pioneered the reduction gear system for pumping oil wells. Fourteen hundred Lufkin Worm Gears are now successfully operating in domestic and foreign fields and are considered standard equipment by many large operators. Lufkin Worm Gear Units are made in four sizes to suit well conditions and are adaptable to any type drive . . . They have many points in favor and are ideal for pumping.

The Lufkin Herringbone Gear Unit is new in design and construction and because of its better "fall" meets the need for a cable tool drilling Unit. The Lufkin Herringbone Unit is easily and inexpensively adaptable to any type drive, particularly the regular oil field type single cylinder gas engine of which type we have recently installed twenty-five. Over two hundred Lufkin Herringbone Gear Units now in operation.

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NAME COMPANY CITY STATE

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

Summary of Field Operations for First Six Months 1930 and 1929
Recapitulation—United States

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Total Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Kansas	494	379	222	169	45	24	227	186	115,832	58,953	301¼	...	21,793,463	19,041,870
Texas (Outside G. C.)	2,812	3,124	1,429	1,644	200	225	1,183	1,255	810,080	2,019,388	3,316	3,939	119,546,410	108,544,400
Gulf Coast	701	620	425	373	27	16	249	231	271,720	236,667	836½	481	36,620,852	26,437,620
North Louisiana	359	243	131	42	107	112	121	89	29,954	5,497	2,672	...	.7,312,550	6,467,050
Arkansas	96	154	64	65	5	12	27	77	2,784	15,451	93	...	10,434,200	13,382,050
Eastern States	3,544	3,741	2,034	2,124	811	835	699	782	48,144	107,109	731	...	24,821,000	20,251,050
Rocky Mountain	...	...	...	...	...	...	...	...	...	...	...	...	14,045,600	12,989,830
California	506	526	461	488	...	...	45	38	409,004	856,479	...	...	119,899,600	141,054,450
Oklahoma	1,706	1,651	1,069	893	163	159	474	599	2,648,901	445,866	3,657	1,855½	118,993,060	121,432,370
Total	10,218	10,438	5,835	5,798	1,358	1,383	3,025	3,257	4,336,419	3,745,410	11,606¾	6,275½	473,466,735	469,600,690

New York

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Allegany	185	145	179	140	1	...	5	5	750	465	½	...
Dundee	1	...	...	...	1	...	...	...	...	...	12	...
Schuyler	1	...	...	...	1	...	...	...	...	...	2	...
Total	187	145	179	140	3	...	5	5	750	465	14½	...

Pennsylvania

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Alleghney	19	14	9	6	7	4	3	4	49	31	7	5½
Beaver	6	7	3	4	...	2	3	1	9	26	...	1¼
Bradford	686	762	685	691	1	2	...	69	3,119	2,985	¼	7½
Butler	65	68	37	40	10	14	18	14	92	1,745	9½	31
Center-Middle	18	37	17	36	1	1	...	...	68	142	¼	¼
Clarion	12	52	11	37	1	10	...	5	24	146	...	11¾
Greene	50	42	7	5	26	30	17	7	56	70	18¾	31
Venango	118	90	89	76	18	12	11	2	186	166	11	7¾
Washington	12	10	8	5	2	4	2	1	64	377	2¼	2¾
Westmoreland	...	1	...	...	...	...	...	1	...	...	...	...
Total	986	1,083	866	900	66	79	54	104	3,667	5,688	49	98¾

Northwestern Ohio

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Allen	8	8	8	7	...	...	...	1	240	130	...	...
Auglaize	5	1	1	1	...	...	4	...	10	10	...	...
Drake	...	1	...	1	...	...	...	...	...	8	...	...
Hancock	13	13	10	9	2	3	1	1	237	280	¾	1
Hardin	4	2	3	...	1	1	...	1	101	...	¾	...
Huron	3	...	...	...	3	...	...	...	...	...	¾	...
Henry	2	...	1	...	...	...	1	...	30	...	...	...
Lucas	2	1	2	...	...	...	...	1	13	...	...	...
Mercer	6	5	3	3	2	1	1	1	20	12	¼	¼
Ottawa	5	1	3	1	2	...	...	...	8	6	½	...
Sandusky	12	...	7	...	1	...	4	...	75	...	¼	...
Seneca	28	17	8	7	6	3	14	7	126	94	3¾	1½
Shelby	2	1	2	1	...	...	...	...	25	10	...	...
Van Wert	...	1	...	1	...	...	...	...	...	8	...	...
Wood	6	9	4	6	...	...	2	3	28	82	...	...
Wyandot	...	2	...	...	...	1	...	1	...	...	...	¾
Total	96	62	52	37	17	9	27	16	913	640	7	3½

*Millions of Cubic Feet.

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

Central Ohio

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Ashland	53	70	16	17	18	25	19	28	143	433	18¾	29½
Ashtabula	4	3	...	...	1	...	3	3	...	...	...	...
Athens	63	73	12	6	34	48	17	19	35	13	1¼	...
Belmont	14	7	2	2	9	2	3	3	78	12	12¾	30¾
Brown	1	...	...	...	...	...	1	...	...	...	2¾	2¼
Coshocton	15	21	9	15	5	4	1	2	343	686	4	17¾
Columbiana	...	2	...	2	...	...	...	...	...	4	...	...
Cuyahoga	5	7	3	...	...	6	2	1	18	...	...	1
Fairfield	5	6	...	1	1	5	4	...	...	14	¼	1¼
Gallia	1	3	...	...	...	3	1	...	...	...	...	¾
Guernsey	27	23	17	6	4	6	6	11	749	177	3¼	3¾
Harrison	2	...	1	...	...	...	1	...	2	...	...	...
Hocking	28	36	11	27	6	1	11	8	366	1,077	10	2
Holmes	12	26	3	5	5	12	4	9	90	95	9¾	13½
Jackson	5	25	...	...	4	20	1	5	...	...	2	15½
Knox	30	23	3	1	21	14	6	8	82	100	33¼	15¾
Lake	1	...	...	...	...	...	1	...	...	...	...	...
Lawrence	5	9	1	...	3	4	1	5	60	...	1	6½
Licking	48	69	38	44	7	10	3	15	2,021	778	2	3¼
Lorain	21	18	...	...	14	12	7	6	...	...	22¾	17¼
Medina	14	12	2	5	7	8	5	8	10	66	23½	9¼
Meigs	35	50	9	27	12	12	14	11	44	201	5½	5
Morrow	1	...	...	...	...	...	1	...	...	...	...	...
Muskingum	97	35	49	22	24	5	24	8	4,192	1,906	29	9
Perry	58	72	29	40	14	18	15	14	1,767	2,041	11	15
Pike	5	...	...	...	3	...	2	...	...	...	¾	...
Richland	6	5	...	...	3	4	3	1	...	...	2¾	12
Sciato	2	...	...	...	...	...	2	...	...	...	...	...
Stark	13	4	...	1	9	2	4	1	...	3	39¼	3
Summit	38	39	...	1	29	26	9	12	...	30	68½	41¾
Trumbull	1	...	...	...	...	...	1	...	...	...	...	...
Tuscarawas	18	2	6	1	11	...	1	1	595	1	7½	...
Vinton	16	12	8	4	4	4	4	4	49	42	3¼	5½
Wayne	25	32	1	2	16	19	8	11	37	5	11¼	21½
Total	669	693	220	229	264	273	185	191	10,681	7,684	285¼	283¾

Southeastern Ohio

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Belmont	...	3	...	2	...	...	...	1	...	11	...	...
Carroll	...	1	...	...	...	...	...	1	...	...	...	...
Jefferson	5	8	5	4	...	...	...	4	46	26	...	...
Harrison	...	3	...	2	...	1	...	...	...	7	...	1
Monroe	68	56	19	18	23	18	26	20	134	217	7	7
Morgan	72	57	21	2	34	51	17	4	107	83	15¼	23
Noble	38	42	14	22	8	5	16	15	62	88	2½	1½
Washington	62	83	28	33	16	29	18	...	200	...	6¾	14
Total	245	253	87	83	81	104	77	66	503	624	31½	33¾
Grand Total Ohio	1,010	1,008	359	349	362	386	289	273	12,097	8,948	324¾	320¼

Indiana

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Adams	2	...	1	...	...	...	1	...	30	...	...	...
Clay	1	...	...	...	...	...	1	...	...	...	...	...
Crawford	1	1	...	...	1	...	...	1	...	...	½	...
Davies	2	...	2	...	...	...	...	...	25	...	...	...
Decatur	2	...	...	...	2	...	...	...	...	...	1½	...
Dubois	2	...	...	...	...	...	2	...	...	...	...	...
Gibson	6	22	2	5	2	5	2	12	66	76	1	15½
Grant	...	1	...	...	...	...	...	1	...	...	...	...
Green	...	1	...	...	...	...	...	1	...	...	1¾	1
Hancock	3	1	...	...	3	1	...	...	...	...	¾	...
Harrison	2	...	...	...	2	...	...	...	...	...	...	...
Jay	1	1	1	1	...	...	...	...	15	25	...	...
Lawrence	1	...	...	...	...	...	1	...	...	...	...	...
Madison	1	...	...	...	1	...	...	...	...	...	½	...
Marion	...	2	...	...	1	1	...	1	...	...	...	¾
Monroe	4	...	...	...	1	...	3	...	...	...	1	...
Perry	7	...	1	...	1	...	5	...	8	...	½	...
Pike	29	13	20	3	5	6	4	4	863	45	4¾	6¾
Rush	...	1	...	...	...	1	...	...	...	...	...	...
Spencer	11	14	5	7	...	...	6	7	124	142	...	...
Sullivan	2	6	1	3	...	1	1	2	60	40	...	2
Vanderberg	...	1	...	...	...	...	...	1	...	...	...	...
Vigo	7	3	7	3	...	...	...	...	595	255	...	...
Total	84	71	40	23	18	16	26	32	1,786	588	12½	26

*Millions of Cubic Feet.

How the reenforcement used in

At left is shown application of Barrett Specification Pipe Line Enamel by revolving pipe method. Pipe turns away from pouring operation and the operator on opposite side spreads the coating to an even flow. No air or moisture will penetrate this homogeneous film.

For pipe of large diameter The Barrett Company will furnish equipment required to revolve pipe and spread enamel.

Barrett Pipe Line Felts especially designed to reenforce hot enamels, are included in several Barrett Specifications to combat unusual soil conditions. They are strong enough to withstand exceedingly tight wrapping stresses when heated by hot coatings as well as the rough handling to which they are subjected during construction.

HERE are several interesting facts about the internal *reenforcement* used in Barrett Specification Pipe Line Enamel. They clearly attest the greater efficiency of pipe line protection provided by Barrett formulas.

Perhaps of greatest importance is this fact: That Barrett uses a flake-type *reenforcement* as distinguished from ordinary dust-type *filler*. This *reenforcement* is of such structure and character that a greater percentage of coal-tar pitch, the best known waterproofing agent, can be used—and is found in Barrett Pipe Line Enamel. And remember it is the quantity and quality of coal-tar pitch in pipe enamels which determines their waterproofing efficiency.

Another notable fact is that this flake-type *reenforcement* laminates in association with the pitch—and adds tensile strength and toughness to the finished enamel.

This flake-type *reenforcement* is also highly dialectric in combination with the insulating properties of bitumen used. It is made from a material admitted to be one of the best electric insulators known.

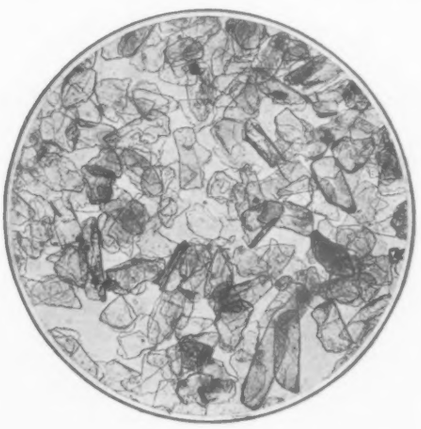
Still another fact: In using this flake-type *reenforcement* the point of adequate flow is at lower temperaturers which reduces fumes to a minimum and saves fuel at the time of application. In addition it is non-porous, non-absorbent and chemically inert.

Barrett Anti-Corrosion Products and Specifications are the result of 76 years' experience in producing waterproof and weatherproof protection. In these years of experience there were produced such other

Barrett Specification PIPE LINE ENAMEL

provides a thick, sound pipe coating

This photo-micrograph shows how flakes of the internal reenforcement used by Barrett tend to interlock. They laminate with the waterproofing agent, giving Barrett Pipe Line Enamel unusual tensile strength and toughness.



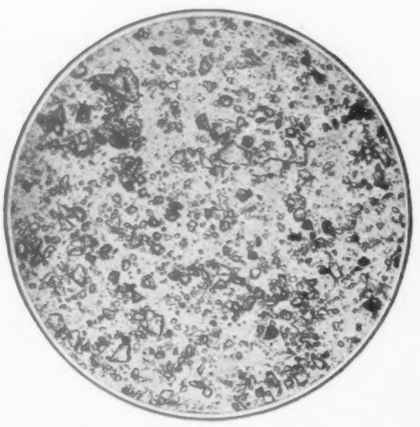


Photo-micrograph above shows how the granular or dust-type filler looks. It is composed of tiny smoothly surfaced particles in loose contact.

internationally used Barrett products as Barrett Specification Roofs, Tarvia and Barrett Underground Waterproofings for tunnels, dams, subways and the like.

The Barrett Company is organized to give you the closest and fullest cooperation from beginning to end of the pipe laying job.

BARRETT SPECIFICATION ANTI-CORROSION PRODUCTS

Made to meet all the many different conditions of pipe line constructions. They include felt reenforced enamels for rivers, swamps and other extreme conditions; enamels to be applied hot in less corrosive sections; cold applications for still less corrosive parts.

This procedure of determining the filler or internal reenforcement content of pipe line enamel is a standard of the American Society for Testing Materials.

The *Barrett* Company

40 Rector St., New York

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

West Virginia

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Boone	65	31	6	3	58	28	1	...	51	14	55¼	25½
Braxton	...	2	...	...	...	...	...	2	...	...	...	...
Cabell	23	9	...	...	22	9	1	...	...	...	16½	6½
Calhoun	59	64	14	8	35	51	10	5	76	71	36	52
Clay	27	13	21	9	4	4	2	...	386	143	2½	1¼
Doodridge	17	9	12	3	3	4	2	2	63	18	¾	1¾
Fayette	1	...	...	...	1	...	...	...	...	...	1	...
Gilmer	24	40	5	15	8	21	11	4	55	385	11¾	28½
Hancock	2	3	1	2	1	1	...	...	2	7	¼	½
Harrison	8	12	2	...	6	12	...	...	11	...	7¾	15
Jackson	8	14	2	11	...	1	6	2	10	217	...	¼
Kanawha	41	12	4	2	32	9	5	1	44	15	30½	7
Lewis	3	5	1	...	1	4	1	1	10	...	½	6½
Lincoln	27	52	4	1	23	50	...	1	11	4	6¼	26
Logan	5	8	...	...	4	7	1	1	...	...	5¾	5
Marion	19	15	...	1	17	11	2	3	...	2	24¼	13¾
Marshall	20	9	...	...	19	5	1	4	...	8	24¼	2¼
Mason	1	...	...	...	1	...	...	...	...	...	1¾	...
Mingo	8	8	2	2	6	6	...	...	11	13	12	26¼
Monongalia	10	10	3	1	3	9	4	...	29	25	4¾	11¼
Pleasants	11	6	8	2	...	1	3	3	36	6	...	¼
Putnam	16	5	1	...	13	4	2	1	1	...	15¾	3¼
Raleigh	1	...	...	...	...	...	1	...	...	...	...	...
Ritchie	50	62	18	20	20	23	12	19	135	142	10½	12¾
Roane	43	41	25	16	13	23	5	2	989	794	14¾	30
Roanoke	...	1	...	...	...	1	...	...	...	...	...	...
Tyler	10	15	2	5	4	4	4	6	15	18	1	3¾
Upshur	1	1	...	...	1	1	...	...	...	...	1	2
Washington	...	...	...	...	...	...	...	...	...	...	...	...
Wayne	13	10	...	...	12	9	1	1	...	...	16	6
Wetzel	13	13	5	3	4	6	4	4	56	7	4½	10¼
Wirt	5	4	2	4	2	...	1	...	5	12	1¾	...
Wood	18	11	5	5	3	2	10	4	24	40	1¼	½
Total	549	485	143	113	316	306	90	66	2,020	1,941	269	298

Michigan

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Allegany	2	...	1	...	...	...	1	...	1	...	...	...
Alpina	1	...	...	...	...	...	1	...	...	...	...	...
Barren	1	...	...	...	...	...	1	...	...	...	...	...
Cass	4	...	1	...	...	...	3	...	15	...	...	...
Clare	2	...	...	...	...	...	2	...	...	...	...	...
Kent	1	...	1	...	...	...	1	1	...	...	...	...
Huron	...	1	...	...	...	...	...	1	...	...	...	...
Isabella	49	7	43	7	...	...	6	...	8,398	1,993	...	...
Ingham	1	...	...	...	...	...	1	...	...	...	...	...
Kalkaskia	2	...	...	...	...	...	2	...	...	...	...	...
Lake	2	...	...	...	...	...	2	...	...	...	...	...
Livingston	1	...	...	...	...	...	1	...	...	...	...	...
Manistee	3	1	...	...	3	...	...	1	...	...	3¼	...
Mason	2	1	...	...	2	1	...	...	...	...	4	...
Midland	21	8	19	2	...	...	2	6	4,163	1,355	...	...
Montcalm	1	...	...	...	...	...	1	...	...	...	...	...
Muskegon	15	216	10	157	3	16	2	43	975	68,716	8	133½
Newyago	...	3	...	...	...	1	...	2	...	...	...	8
Oceana	4	2	...	...	...	...	4	2	...	...	...	...
Ottawa	1	2	...	...	...	...	1	2	...	...	...	...
Saginaw	1	...	1	...	...	...	...	...	35	...	...	...
Van Buren	2	...	...	...	...	...	2	...	...	...	...	...
Washington	...	...	...	...	...	...	...	...	...	...	...	...
Total	116	246	75	166	8	18	33	62	13,587	72,064	15¼	141½

Tennessee

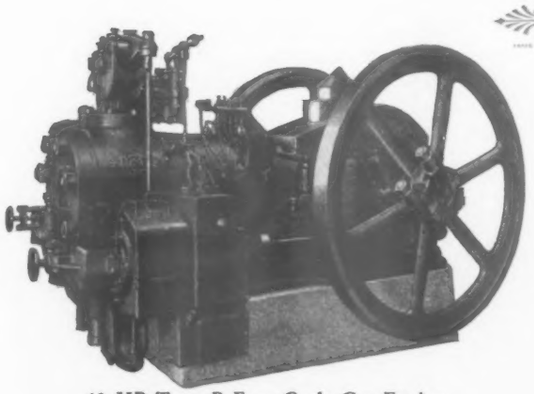
County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Wildcats	1	3	...	2	...	...	1	1	...	60	...	...
Total	1	3	...	2	...	...	1	1	...	60	...	...

REID OIL FIELD MACHINERY

Band Wheel Power with 20-ft. diameter wheel and 20-inch throw eccentrics

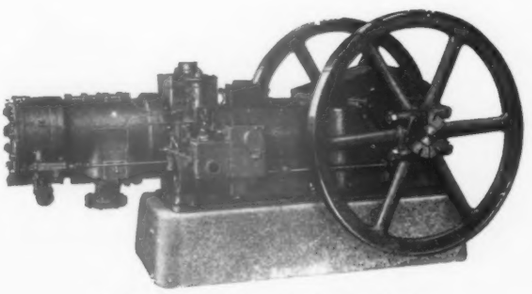
Reid Band Wheel Powers are equipped with either Timken Tapered Roller Bearings or bronze bearings, and are furnished with 14, 16, 18, 20, or 24-foot diameter wheels and 20, 24, 30 and 36-inch throw eccentrics.

Reid



40 HP Type B Four Cycle Gas Engine

Reid Type B Four Cycle Gas Engines are built in the following sizes: 30, 35, and 40 horsepower, 12¾″x18″ which is rated by cylinder size and develops 45 HP at 175 r.p.m.; and the 16″x21″, also rated by cylinder size, which develops 70 HP at 150 r.p.m. and 100 HP at 225 r.p.m.



40 HP Type C Two Cycle Gas Engine

Reid Type C Two Cycle Gas Engines are built in four sizes; 35, 40, and 45 horsepower, and the 12½″x18″ which is rated by cylinder size and develops 80 HP at 180 r.p.m. and 125 HP at 350 r.p.m.

Our representatives will be glad to furnish complete information on our line of Oil Field Machinery

JOSEPH REID GAS ENGINE COMPANY
OIL CITY, PENNSYLVANIA, U. S. A.

BRANCHES—Marietta, Newark, and Logan, Ohio; Charleston, W. Va.; S. R. Shoup, 724 Board of Trade Building, Los Angeles, California.

EXPORT SALES REPRESENTATIVE—Oil Field Equipment Co., Inc., 30 Church Street, New York City.

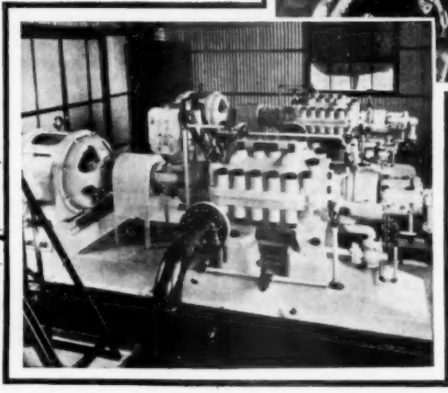
DISTRIBUTORS—Frick-Reid Supply Corp., Pittsburgh, Pa., and Tulsa, Okla., Distributors for Bradford and Pittsburgh, Pa., Muskegon and Mt. Pleasant, Mich., Kentucky, Oklahoma, Kansas, Texas, Arkansas, Louisiana, and Wyoming; R. B. Moore, Bolivar, N. Y.; distributed in California by The Republic Supply Co. of California, Los Angeles, Calif.

for every Elèctric Aid in Production,

360 DEGREES

WESTINGHOUSE ELECTRIC

150-hp. Westinghouse Induction Motors driving 5-stage Cameron centrifugal pumps in a pumping station at Signal Hill, Calif.



A Westinghouse-equipped power house in a refinery. An example of by-product power generation.

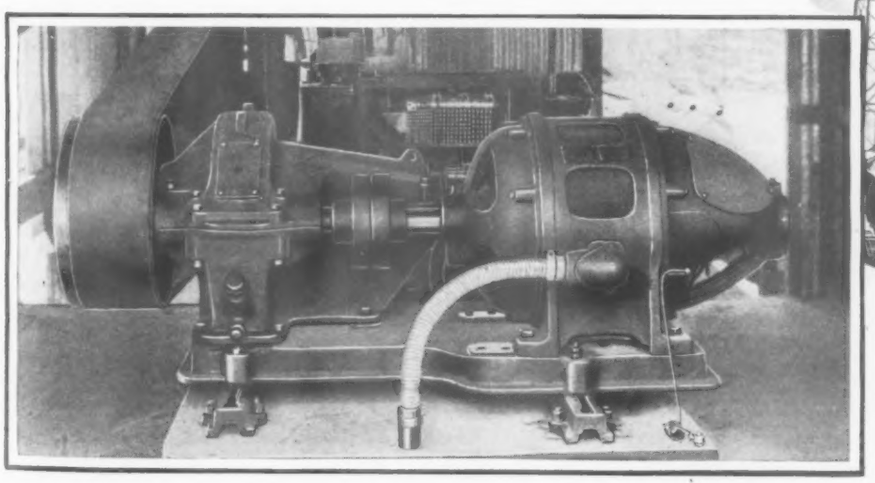
Refining and Transportation . . . . . .

of ELECTRICAL RESPONSIBILITY

THE functioning of Westinghouse in your interest may be likened to a complete cycle of service, of which constant improvement through ceaseless research forms the beginning and the end.

From RESEARCH in the great Westinghouse experimental laboratories, the thread of responsibility is carried to DESIGN, wherein Westinghouse engineers apply to the drawing-board the facts brought them from that store-house of accumulated knowledge. Next comes MANUFACTURE, whereby accurate plans become three-dimensional realities, then APPLICATION, through which carefully designed apparatus becomes standardized for its particular use. Through SALES and SERVICE come the contacts in the field, carrying back to headquarters the problems which provide new stimulus to RESEARCH—and the cycle, thus completed, begins anew.

The Westinghouse line, comprising some 320,000 separate products, is readily accessible everywhere through conveniently located warehouses. Westinghouse service, including expert technical assistance in the planning of all electrical installations, is available through trained representatives specializing in your industry. Get complete information from the nearest Westinghouse office, or any branch of the Oil Well Supply Company or the National Supply Companies.



20/50 hp., 2-speed Oil Field Motor with OP single reduction gear and belt drive for deep well pumping.

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

WESTINGHOUSE ELECTRIC

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

Kentucky

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Allen	...	33	...	13	...	...	...	20	...	49	...	...
Barren	...	5	...	5	...	...	...	...	...	53	...	...
Bell	1	...	...	...	1	...	...	...	...	2	2	...
Brechenridge	...	2	...	...	...	...	...	2	...	...	...	...
Caldwell	...	1	...	1	...	...	...	...	...	15	...	...
Clay	4	3	...	...	3	2	1	1	...	...	1¼	3½
Christian	1	...	...	...	1	...	...	...	...	...	2	...
Daviess	92	203	54	121	3	5	35	77	1,940	4,492	3	4¾
Estill	2	21	2	16	...	...	...	5	4	41	...	...
Floyd	...	1	...	...	...	1	...	...	...	...	...	2
Hancock	7	14	6	4	1	3	...	7	87	44	½	4
Hardin	...	2	...	...	...	...	...	2	...	...	...	...
Henderson	54	6	37	6	3	...	14	...	1,040	92	1¾	...
Hopkins	2	4	...	...	1	1	1	3	...	...	½	2
Johnson	3	1	2	1	...	...	1	...	4	15	...	...
Jackson	3	...	...	...	1	...	2	...	...	...	¼	...
Knox	2	1	...	...	2	...	...	1	...	...	3¼	...
Lawrence	16	...	16	...	...	...	...	...	111	...	...	...
Lee-Owsley	3	4	3	1	...	2	...	1	32	5	...	1¾
Magoffin	9	17	9	15	...	...	...	2	38	194	...	...
McCreary	4	...	3	...	...	...	1	...	19	...	...	...
McLean	14	5	10	2	...	...	4	3	310	23	...	...
Menifee	...	1	...	1	...	...	...	...	...	6	...	...
Morgan	1	...	1	...	...	...	...	...	2	...	...	...
Muhlenberg	8	1	4	1	2	...	2	...	385	200	9	...
Ohio	246	241	152	176	19	9	75	56	8,282	9,061	16½	10
Perry	1	...	...	...	1	...	...	...	...	...	5	...
Pike	...	1	...	...	...	1	...	...	...	...	...	1½
Powell	1	1	1	1	...	...	...	...	7	6	...	...
Rowan	...	1	...	...	...	1	...	...	...	...	...	2
Simpson	...	1	...	...	...	...	...	1	...	...	...	...
Trigg	...	1	...	...	...	1	...	...	...	...	...	1
Warren	8	17	4	9	...	2	4	6	14	27	...	3
Wayne	13	17	6	7	...	...	7	10	15	22	...	...
Wolfe	1	2	1	2	...	...	...	...	3	15	...	...
Total	496	607	311	282	38	28	147	197	12,293	14,428	46	35½

Illinois

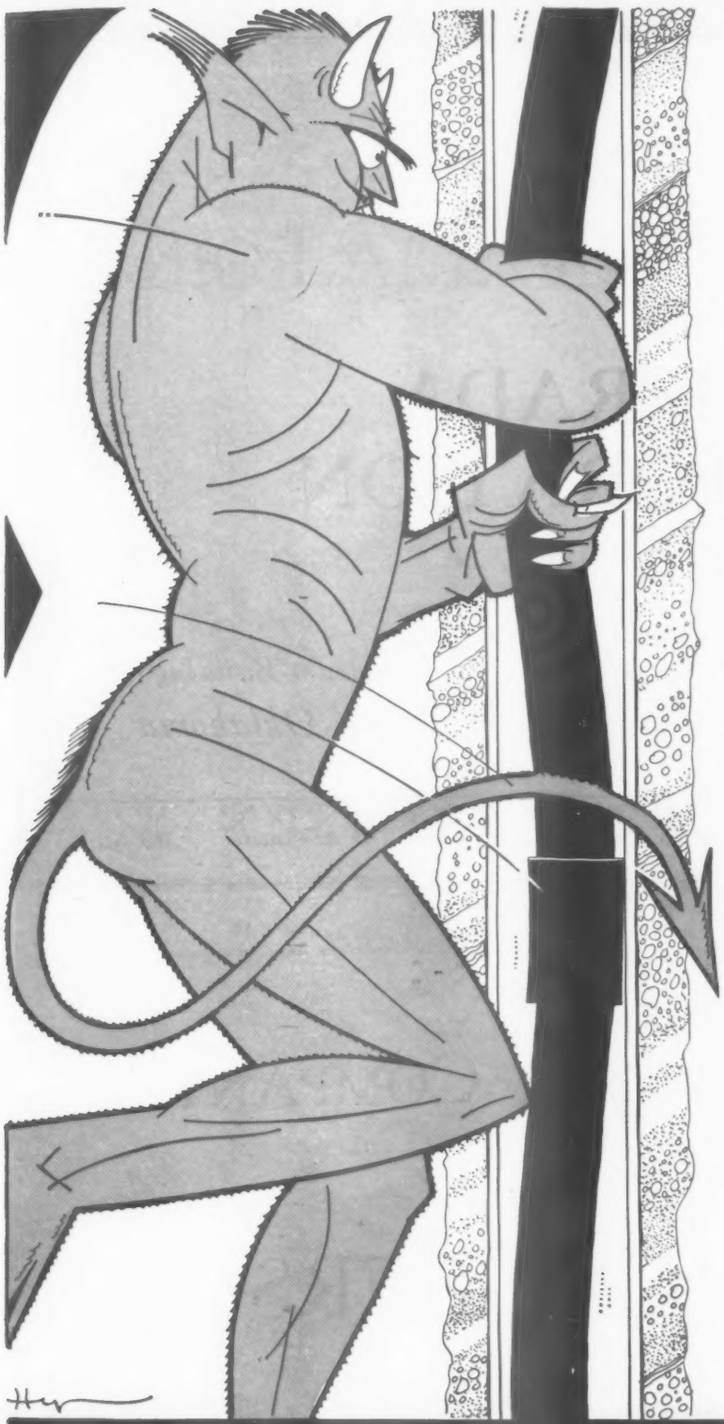
County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Clark	4	4	1	2	...	...	3	2	45	4	...	...
Clay	...	1	...	...	...	...	...	1	...	...	...	...
Clinton	1	...	...	...	...	...	1	...	...	...	...	...
Crawford	27	13	17	10	...	1	10	2	272	89	...	¼
Cumberland	...	1	...	...	...	...	...	1	...	...	...	...
Lawrence	11	9	7	5	...	...	4	4	432	454	...	...
Marion	...	1	...	...	...	...	...	1	...	...	...	...
McDonough	2	...	...	...	...	...	2	...	...	...	...	...
Monroe	5	1	1	...	...	...	4	1	10	...	...	...
St. Clair	46	23	28	15	...	...	18	8	1,092	1,481	...	...
Wabash	13	26	7	13	...	...	6	13	93	524	...	...
Total	109	79	61	45	...	1	48	33	1,944	2,912	...	¼

Mississippi

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Wildcats	6	9	...	...	...	...	6	9	...	...	...	...
Total	6	9	...	...	...	...	6	9	...	...	...	...
Total Eastern States 1st. 6 Mos 1930 and 1929	3,544	3,741	2,034	2,124	811	835	699	782	48,144	107,109	731	...

Total Production 6 Mos, 1930.....24,821,000—Barrels
Total Production 6 Mos. 1929.....20,251,050—Barrels

*Millions of Cubic Feet.



The FRICTION DEMON

has hold of your unprotected drill pipe

Friction lurks at every kink and spiral in wait for your unprotected drill pipe. Drill pipe fatigue, casing failures and twist-offs are invariably due to friction. Bettis Protectors prevent excessive friction by avoiding all metal-to-metal contact between your casing and drill pipe. Bettis Protectors save time, power and money. That is why close to 100% of the rotary drilling wells are equipped with these genuine all-rubber anti-friction protectors.

Bettis Protectors have many uses in addition to preventing abrasion of drill pipe and casing.

1. *On Kelly Sub*—to stabilize and reduce whipping.
2. *On Cement Job* — to center when drilling out plug.
3. *On perforated Liner*— to keep liner in center of hole and allow free oil flow around all sides.
4. *On Casing in Cement Job*—to center casing and insure even thickness of cement wall.
5. *For Stabilizing Inside Stove-Pipe*—for use on drill pipe inside large diameter stove-pipe to stabilize.

Further information will be supplied on request.

FULLY PATENTED

"Beat bet yet"

Patterson-Ballagh Corporation

Insurance Exchange Building, Los Angeles

Texas and Gulf Coast Distributors:
BETTIS SALES CO.,
917 Merchants & Mfrs. Bldg., Houston

Oklahoma Distributors:
BAILEY & BECKER COMPANY,
410 Thompson Bldg., Tulsa

New York Office: 39 Cortlandt St.

Carried in stock at Los Angeles, Ventura, Kettleman Hills, Bakersfield, Coalinga and Long Beach, California. Tulsa and Oklahoma City, Oklahoma. Houston, Texas. Hobbs, New Mexico. Calgary, Alberta, Canada. New York City.

Bettis Protectors & Drill Stabilizers

General Offices
65 Broadway, New York

AMERADA CORPORATION

Petroleum Building
Tulsa, Oklahoma

STALEY, WYNNE & COMPANY

OIL PRODUCERS

OFFICES:

STALEY BUILDING WICHITA FALLS, TEXAS

BIG LAKE OIL COMPANY

Producers of

Reagan County High Grade

CRUDE OIL

and

NATURAL GASOLINE

Executive Offices
PITTSBURGH, PENNA.

Field Offices
TEXON, TEXAS

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

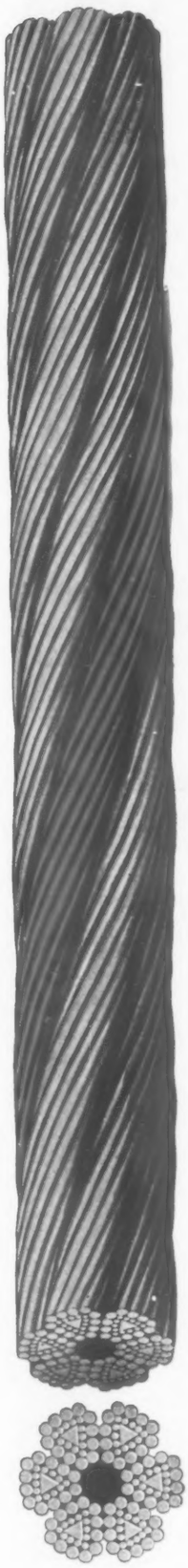
California

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Athens-Rosecrans	3	4	3	4	...	...	...	...	2,800	1,425			See page 194.	
Belridge	2	9	2	9	...	...	...	...	45	535				
Brea-Olinda	...	2	...	2	...	...	...	...	...	650				
Cat Canyon	...	1	...	1	...	...	...	...	...	200				
Dominguez	...	1	...	1	...	...	...	...	...	200				
Elwood-Goleta	11	4	11	4	...	...	...	...	39,758	17,200				
Fruitvale	6	9	6	9	...	...	...	...	2,450	66,375				
Huntington Beach	6	15	6	15	...	...	...	...	800	9,410				
Inglewood	1	8	1	8	...	...	...	...	150	1,890				
Kern Front	15	18	15	17	...	...	...	1	2,250	4,260				
Kettleman Hills	5	...	5	...	...	...	...	...	14,976	...				
Lawndale	...	4	...	1	...	...	...	3	...	1,200				
Long Beach	90	125	90	123	...	...	...	2	84,910	109,687				
McKittrick	1	1	1	1	...	...	...	...	35	100				
Maricopa Flats	29	...	29	...	...	...	...	...	34,285	...				
Midway-Sunset	4	6	4	6	...	...	...	...	1,150	3,675				
Montebello	1	2	1	2	...	...	...	...	250	250				
Mt. Poso Creek	8	8	8	7	...	...	...	1	1,485	2,125				
Newhall	3	...	3	...	...	...	...	...	530	...				
Orella-Capitan	2	...	2	...	...	...	...	...	350					
Potrero	8	1	8	1	...	...	...	...	8,325	200				
Richfield	10	6	10	6	...	...	...	...	1,665	1,575				
Rincon	3	8	3	8	...	...	...	...	1,100	2,005				
Round Mountain	4	5	4	5	...	...	...	...	625	1,274				
Santa Barbara	...	1	...	1	...	...	...	...	...	1,200				
Santa Maria	1	...	1	...	...	...	...	...	50	...				
Santa Fe Springs	217	190	217	190	...	...	...	...	211,027	612,087				
Seal Beach	2	35	2	35	...	...	...	...	600	48,946				
South Mountain	...	1	...	1	...	...	...	...	...	160				
Summerland	4	...	4	...	...	...	...	...	640	...				
Venice	3	...	3	...	...	...	...	...	3,650					
Ventura	20	29	20	29	...	...	...	...	26,800	29,720				
West Coyote	1	1	1	...	...	...	...	1	83	...				
Wheeler	...	1	...	1	...	...	...	...	...	50				
Wildcats	46	31	1	1	...	...	45	30	2,500	1,000				
Total	506	526	461	488	...	...	45	38	409,004	856,479				

Kansas

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil†		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Barber	3	2	...	...	1	1	2	1	...	...	27	22
Barton	2	1	...	...	...	...	2	1	...	...	...	...
Butler	49	55	19	33	...	...	30	22	2,030	4,956	...	...
Chase	9	1	2	...	1	...	6	1	45	...	¾	...
Chautauqua	6	2	1	1	3	...	2	1	85	45	6	...
Clay	2	...	...	...	...	...	2	...	...	...	...	...
Coffey	10	9	6	...	...	3	4	6	440	...	...	6
Cowley	38	46	13	10	11	10	14	26	906	3,855	44¼	11¾
Dickinson	1	...	...	...	...	...	1	...	...	...	...	...
Douglas	1	...	...	...	...	...	1	...	...	...	...	...
Edwards	2	1	1	1	...	...	1	...	240	40	...	...
Elk	12	14	3	7	1	...	8	7	730	407	3	...
Ellis	8	12	6	6	...	...	2	6	964	735	...	...
Ellsworth	2	...	...	...	...	...	2	...	...	...	...	...
Franklin	1	1	...	...	1	...	...	1	...	...	5	...
Greenwood	77	61	50	32	1	2	26	27	6,170	4,335	½	2
Harvey	13	9	1	...	...	2	12	7	275	...	...	51
Hodgeman	1	...	...	...	...	...	1	...	...	...	...	...
Kingman	2	...	...	...	...	...	2	...	...	...	...	...
Labette	1	1	...	...	...	...	1	1	...	...	...	...
Leavenworth	1	...	...	...	...	...	1	...	...	...	...	...
Lyon	9	1	2	...	...	...	7	1	40	...	...	...
Marion	6	12	2	7	...	1	4	4	175	1,470	...	¾
Marshall	1	...	...	...	...	...	1	...	...	...	...	...
McPherson	107	6	76	2	4	...	27	4	89,229	510	37	...
Morris	3	3	1	...	...	2	2	1	20	...	1	...
Morton	1	...	...	...	1	...	...	...	...	...	15	...
Osborne	3	...	...	...	...	...	3	...	...	...	...	...
Pratt	2	...	...	...	...	...	2	...	...	...	...	...
Reno	6	...	1	...	1	...	4	...	1,405	...	1¾	...
Rice	9	...	4	...	1	...	4	...	3,695	...	10	...
Riley	1	...	...	...	...	...	1	...	...	...	...	...
Rooks	1	3	...	...	...	...	1	3	...	...	...	...
Rush	2	3	...	...	1	...	1	3	...	...	24	...
Russel	7	17	5	11	...	...	2	6	575	1,005	...	...
Saline	3	1	...	...	...	...	3	1	...	...	...	...
Sedgewick	39	87	20	54	...	...	19	33	7,868	39,695	...	...
Shawnee	1	...	...	...	...	...	1	...	...	...	...	...
Smith	2	...	...	...	...	...	2	...	...	...	...	...
Stafford	1	...	...	...	...	...	1	...	...	...	...	...
Stevens	14	2	...	...	14	1	...	1	...	...	104	8
Sumner	19	11	5	4	4	2	10	5	840	1,700	25	7
Trego	3	...	...	...	...	...	3	...	...	...	...	...
Washington	1	...	...	...	...	...	1	...	...	...	...	...
Woodson	12	4	4	1	...	...	8	3	120	200	...	...
Total	494	379	222	169	45	24	227	186	115,832	58,953	301¼	109½

† For Production detail see page 194.
* Millions of cubic feet.



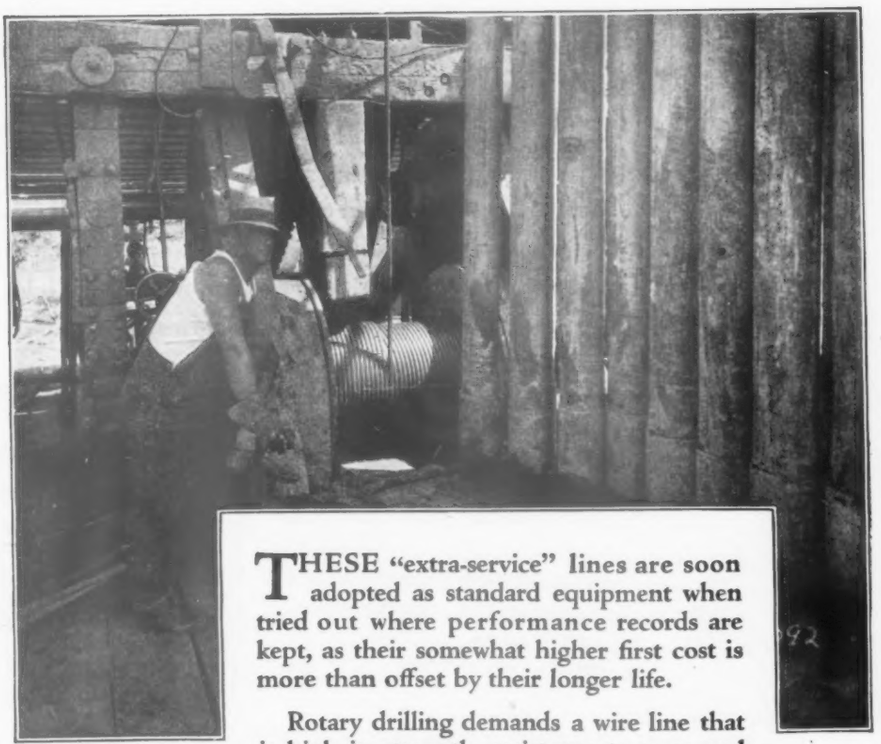
Patent Flattened Strand

"HERCULES"

RED-STRAND

REG. U. S. PAT. OFF.

Rotary Drilling Lines



THESE "extra-service" lines are soon adopted as standard equipment when tried out where performance records are kept, as their somewhat higher first cost is more than offset by their longer life.

Rotary drilling demands a wire line that is high in strength, resistance to wear and resistance to crushing—and it is in these very points that Patent Flattened Strand "HERCULES" (Red Strand) Rotary Lines have decided advantages.

If you are not entirely satisfied with the operating costs on your rotaries, give one of these lines a chance to show you what it can do. Their service record is an unanswerable argument in their behalf.

For Economical Cable-Tool Drilling, Use "CALIFORNIA SPECIAL" Cable Tool Drilling Lines

Made Only By

A. Leschen & Sons Rope Co.

Distributed By

OIL WELL SUPPLY CO.

IT IS NOT TO BOAST

. . . but rather we salute the great petroleum industry.

John F. Cailloux
President

In every organization there is reason for pride in accomplishment. Sometimes the attainment may be greater than was even anticipated. This is true of American Iron and Machine Works Company, during the past four years in particular. We could not attempt to take credit for this most highly appreciated development.

Credit is due to our friends and customers who have made it possible for this organization to serve them. They are the ones in whom we take greatest pride.

Earl W. Miller
Vice-President

Throughout these years it has also been a matter of pride, that every member of this Company feels, in serving those companies operating in practically every American oil field, as well as Canada, Mexico, Trinidad, Dutch East Indies, Venezuela, Rumania, Russia, India and other foreign oil fields.

Wherever Fishing, Drilling and Production tools are used—there you will find American Products for perfect performance.

H. .M. (Mike) Myracle
Secretary and Treasurer

Equipment for every day use is the major part of our business, but it is often a privilege that we enjoy to make special equipment for emergency cases.

Some of this special equipment was made to tame the wild Mary Sudik No. 1, nationally famous, and the Sigmon No. 1 in the Oklahoma City field.

T. A. Brown
Salesman, South America,
care American Consul,
Maricaibo, Venezuela
S. A.

Carl O. Jensen
Salesman, California,
Long Beach, California

Paul K. (P.K.) Ridge
Salesman, South Texas,
San Antonio, Texas

R. J. Morgan
Salesman, Maud, Okla.

R. E. (Bob) Craine
Foreman, Maud Shop

Growing With the Oil Industry

That part of the personnel, whose pictures appear on these pages, greet you. Every member of American Iron and Machine Works Company takes pride in the accomplishment of their Company.

In four years this Company has grown, until today there are more than 140 people compared with 30 that made up the entire organization in 1926.

Four years ago the buildings occupied 8,500 square feet of floor space. . . . Today the buildings required cover 22,000 square feet.

The volume of business for this year is more than twelve times that done four years ago.

Men -- Service -- Products

Business is built up by men of integrity and vision with service when and where needed—given with the proper attitude with products that represent an ideal.

We want every company to know us, and the men you deal with, and we are anxious to know you. We will try to give you the best possible service and products that will be entirely satisfactory.

AMERICAN IRON AND MACHINE WORKS CO.

Oklahoma City, Oklahoma

John R. Riley
Salesman, Oklahoma City

E. W. (Ed) Herring
Salesman, Oklahoma City

Seth W. Smith
Salesman, Oklahoma City

G. C. (Red) Ross
Salesman, Oklahoma City

P. M. (Nick) Rea
Supt., Okla. City Shop

L. J. (Frenchie) Braud
Foreman, Okla. City Shop

T. F. (Floyd) Craine
Foreman, Okla. City Field Shop

Al Backstrom, Night Foreman Okla. City Field Shop

Harry J. Byers
La., Ark. and S. East Tex., Beaumont, Texas

V. R. (Mat) Mattingly
Foreman, Seminole Shop

S. O. Curtis
Salesman, Seminole

E. A. (Ed) Hinton
So. Okla. and West Texas, Wichita Falls, Texas

J. L. (Chat) Chatterton
Salesman, Oklahoma City

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

Oklahoma

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Atoka	1	...	...	...	...	...	1	...	...	...	...	...
Beckham	2	6	1	...	1	5	...	1	100	...	25	102
Blaine	...	1	...	...	...	...	...	1	...	...	...	...
Bryant	2	...	...	...	...	...	2	...	...	...	...	...
Caddo	18	5	12	4	...	...	6	1	5,097	76	...	...
Canadian	1	1	...	...	...	...	1	1	...	...	...	...
Carter	25	38	19	24	...	4	6	10	2,474	1,371	...	59
Comanche	1	4	...	...	...	...	1	4	...	...	...	...
Cotton	68	25	57	10	1	...	10	15	4,233	503	3	...
Creek	115	156	59	66	15	19	41	71	5,231	6,609	33	43¼
Dewey	...	1	...	...	...	...	...	1	...	...	...	...
Garfield	4	1	2	1	...	1	2	...	1,145	...	...	4
Garvin	3	8	...	3	...	...	3	5	...	85	...	...
Grady	7	24	...	2	7	14	...	8	...	200	70	169
Grant	10	6	1	...	5	1	4	5	6	...	30	...
Greer	1	...	...	...	...	...	1	...	...	...	...	...
Harper	...	1	...	...	...	...	...	1	...	...	...	...
Haskell	...	1	...	...	...	1	...	...	...	...	...	1½
Hughes	20	27	4	12	9	7	7	8	792	4,785	86½	179½
Jackson	...	1	...	...	...	...	...	1	...	...	...	...
Jefferson	13	12	10	8	...	1	3	3	1,660	845	...	1
Kay	9	44	4	8	1	13	4	23	360	1,080	3	23¼
Kiowa	17	43	4	5	...	1	13	37	39	87	...	1
Latimer	1	3	...	...	...	2	1	1	...	...	...	11
Le Fore	3	2	...	...	2	1	1	1	...	...	¾	1
Lincoln	13	6	6	...	1	...	6	6	8,525	...	11¼	...
Logan	12	20	7	10	1	1	4	9	6,472	18,733	2	13½
Marshall	59	5	40	...	...	...	19	5	2,757	...	...	...
McClain	2	4	1	...	...	...	1	4	45	...	...	...
McIntosh	4	1	...	...	1	...	3	1	...	...	2	...
Muskogee	113	63	33	18	23	7	57	38	2,657	897	28¾	13
Noble	6	2	3	...	1	1	2	1	1,250	...	17½	6
Okfuskee	70	69	31	39	14	5	25	25	1,823	6,841	311½	112¾
Oklahoma	237	7	221	1	13	5	3	1	2,228,328	6,565	2,227½	284
Okmulgee	56	73	25	32	11	10	20	31	378	1,817	34	33¼
Osage	85	144	50	80	7	7	28	57	4 746	10,591	22½	49½
Pawnee	53	29	31	14	4	4	18	11	2,426	1,665	9¼	6¼
Payne	34	22	22	14	2	1	10	7	8,619	3,621	7½	7½
Pittsburg	9	3	...	...	7	2	2	1	...	...	116	7
Pontotoc	54	36	44	21	1	2	9	13	5,321	5,083	8	13
Pottawatomie	92	281	74	231	4	4	14	46	32,527	194,316	21½	117
Seminole	349	323	267	233	16	19	66	71	317,555	175,955	446½	538
Sequoyah	2	2	...	...	1	1	1	1	...	...	1¼	3
Stephens	68	99	32	53	4	4	32	42	4,236	3,967	79	6½
Texas	1	1	...	...	...	...	1	1	...	...	...	...
Tillman	3	2	...	...	...	...	3	2	...	...	...	...
Tulsa	22	9	4	1	2	1	16	7	38	15	4¼	1
Waggoner	38	37	5	4	9	15	24	18	61	156	56¼	48¾
Woods	...	1	...	...	...	...	...	1	...	...	...	...
Woodward	3	...	...	...	...	...	3	...	...	...	...	...
Totals	1,706	1,651	1,069	893	163	159	474	599	2,648,901	445,866	3,657	1,855½

*Millions of Cubic Feet. †For Production Detail See Page 194.

Texas Panhandle

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Carson	35	24	20	17	11	5	4	2	4,860	4,690	227¼	163	1,668,300	1,146,550
Childress	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Cockran	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Cottle	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Donley	1	...	...	...	...	...	1	...	...	...	...	...		
Gray	125	88	107	75	11	5	7	8	96,365	82,045	402½	856	11,415,250	5,355,550
Hall	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Hartley	1	1	...	1	...	...	...	1	...	...	13½	...	.....	.....
Hutchinson	39	41	32	36	6	5	1	...	7,025	6,850	216¾	102	4,277,700	4,678,300
Lamb	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Moore	4	17	1	11	2	4	1	2	200	3,455	82	68	.....	.....
Motley	1	2	...	...	...	...	1	2	...	...	...	...	.....	.....
Potter	2	...	1	...	1	...	...	...	32	...	20	...	.....	.....
Wheeler	47	40	3	2	41	35	3	3	280	650	1241	1263	114,450	130,250
Others	...	...	...	...	...	...	...	...	...	...	...	...	96,200	343,350
Total	256	217	164	141	73	55	19	21	108,762	97,690	2203	2452	17,571,900	11,654,000

*Millions of Cubic Feet.

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

North Texas

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Archer	255	318	127	142	...	...	128	176	8,733	7,514	...	...	3,301,560	3,159,750
Baylor	38	...	18	...	...	...	20	...	2,950	...	...	...	.....	.....
Burkburnett	...	13	...	7	...	...	...	6	...	165	...	...	1,515,150	1,644,100
Clay	12	29	2	13	2	...	8	16	45	316	5¼	...	.....	.....
Cooke	45	90	14	56	...	3	31	31	508	7,819	...	...	1,985,000	2,060,650
Electra	...	71	...	46	...	...	...	25	...	2,030	...	...	2,063,350	2,362,900
Fannin	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Foard	4	2	1	...	1	...	2	2	80	...	3	...	.....	.....
Grayson	4	8	...	...	...	3	4	5	...	...	...	25¼	.....	.....
Haskell	2	8	...	2	1	...	1	6	...	170	...	4	.....	.....
KMA—Iowa Park	...	140	...	102	...	...	...	38	...	9,930	...	...	951,350	1,070,900
Knox	...	2	...	...	...	...	...	...	...	...	...	...	.....	.....
Montague	31	...	20	...	...	...	11	...	1,455	...	...	...	.....	.....
Throckmorton	14	13	...	4	1	1	13	8	...	85	2½	10	156,250	120,200
Wilbarger	120	226	87	176	...	...	33	50	12,147	25,388	...	...	4,609,750	4,830,250
Wichita	122	...	75	...	...	...	47	...	4,298	...	...	...	.....	.....
Others	...	...	...	...	...	...	...	...	...	...	...	...	339,450	101,250
Total	647	953	344	565	5	6	298	382	30,216	57,372	10¾	35¼	14,921,860	15,350,000

West Texas

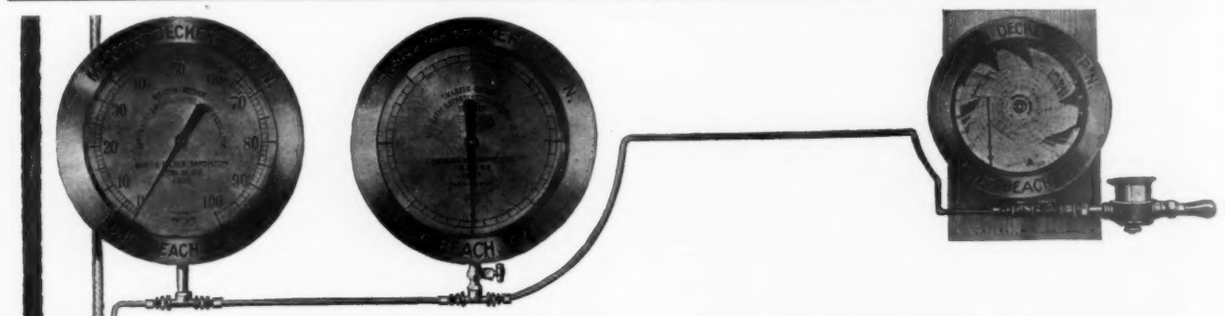
County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Crane	19	10	18	9	...	...	1	1	11,170	2,160	...	...	7,912,000	8,857,400
Crockett	5	...	5	...	...	...	...	...	620	...	...	...	382,450	396,650
Ector	39	...	37	...	1	...	1	...	23,990	...	5	...	1,294,750	.....
Fisher	3	3	2	1	...	...	1	2	1,365	50	...	...	.....	.....
Glasscock	16	...	16	...	...	...	...	...	14,810	...	...	...	.....	.....
Howard	52	114	48	112	...	...	4	2	11,365	60,485	...	...	6,703,500	7,843,000
Irion	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Jones	2	35	2	26	...	...	...	9	265	5,815	...	...	343,750	1,008,850
Loving	5	4	5	4	...	...	...	...	1,740	1,000	...	...	.....	.....
Mitchell-Scurry	4	2	2	2	...	...	2	...	180	170	...	...	411,250	490,500
Pecos	95	53	89	42	2	...	4	11	74,590	276,915	74¾	...	1,345,800	16,105,600
Reagan	6	13	6	13	...	...	...	...	2,035	3,075	9¼	...	3,076,150	3,362,500
Upton	9	4	9	4	...	...	...	...	1,110	305	...	...	.....	.....
Ward	14	3	11	3	...	...	3	...	719	435	3	...	.....	.....
Winkler	3	139	3	127	...	...	...	12	1,090	499,505	...	...	14,859,300	28,319,950
Yates (See Pecos)	...	...	...	...	...	...	...	...	...	...	...	...	22,241,850	.....
Wildcats	110	154	7	11	2	6	101	137	585	3,223	2½	52½	.....	.....
Others	...	...	...	...	...	...	...	...	...	...	...	...	590,350	326,750
Total	383	534	260	354	5	6	118	174	145,994	853,138	104	52½	59,161,150	56,711,200

West Central

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Brown	126	192	46	63	8	8	72	121	2,480	2,083	10½	7¾	1,438,600	1,550,950
Callahan	72	86	9	29	5	2	58	55	355	884	11¾	2¾	667,350	686,050
Coleman	103	114	32	26	10	19	61	69	2,137	2,998	39	58½	901,000	662,150
Comanche	13	7	2	4	5	1	6	2	30	105	9½	¼	.....	.....
Eastland	61	78	20	22	13	6	28	50	1,320	3,100	56	21¾	1,038,900	1,194,800
Erath	15	17	...	...	6	12	9	5	...	...	10½	71	.....	.....
Hood	1	2	...	...	...	...	1	2	...	...	...	...	.....	.....
Jack	33	32	25	17	...	2	8	13	2,635	4,055	8	17½	748,850	347,850
Kimble	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
McCulloch	2	6	...	...	...	1	2	5	...	...	...	2½	.....	.....
Mills	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Palo Pinto	26	18	8	1	8	10	10	7	283	35	17¼	28½	115,450	70,600
Parker	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
San Saba	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Shackelford	90	164	29	80	1	1	60	83	1,380	8,606	½	12½	1,373,600	2,279,700
Stephens	34	42	12	12	12	8	10	22	3,469	778	65¾	28½	1,081,950	1,160,100
Throckmorton	14	...	...	...	1	...	13	...	...	...	2½	...	156,250	.....
Young	429	252	210	119	1	...	218	133	49,362	4,100	14	...	2,478,750	1,291,500
Others	...	...	...	...	...	...	...	...	...	...	...	...	246,300	123,800
Total	1024	981	393	357	70	68	561	556	63,451	22,889	245	252½	10,247,000	9,367,500

*Millions of Cubic Feet.

MARTIN-DECKER AUTOMATIC WEIGHT INDICATOR



SATISFACTION

Expressed by one of the hundreds of satisfied users of Martin-Decker Products

RAY T. MOORE
SECRETARY-TREASURER

PAUL F. TRAVIS
PRESIDENT

PLYMOUTH OIL COMPANY
625 STOCK EXCHANGE BUILDING
LOS ANGELES, CAL.
Tucker 3641

July 21,1930.

Martin-Decker Corporation
3431-45 Cherry Avenue,
Long Beach, California.

Gentlemen:

On June 10th,1930, we completed our Plymouth #10 Well in the old section of Signal Hill to a depth of 6961 feet for a daily flow of 5500 barrels of clean oil. We completed this well in 64 drilling days and, considering that the well was located close to the fault line where the formations steeply dip, we believe this is exceptionally good time.

We believe due credit should be given to your Weight Indicator for the part it played in this successful completion.

We were one of the first concerns in California to use this instrument and have been using them on every well since their development.

On this well we used the new set-up, installing the indicating gauge and the Vernier gauge in your new steel box on a post directly in front of the draw works close to the driller.

Your Vernier permits a much closer control of weight on the bit and mounting as we did in front of the draw works, it was much easier for the driller to control his bit pressure. We are using the same set-up on our new wells, Plymouth # 11 and #12.

Very sincerely yours,

PLYMOUTH OIL COMPANY,

by Ray T. Moore
Secy

RTM/hs

MARTIN-DECKER

Mid-Continent Distributors
Reed Roller Bit Company
Houston, Texas

Foreign Distributors
Oil Well Supply Company
Pittsburgh, Pa.

WEIGHT RECORDING, MEASUREMENT AND CONTROL

MARTIN-DECKER AUTOMATIC WEIGHT INDICATOR

WEIGHT CONTROL

Much has been said about "control of Bit Pressures"

Here is a simple, positive, inexpensive way to do it. The Martin-Decker Automatic Recording Weight Indicator, with Super-sensitive Vernier Gage.

An Ideal Installation

The 100 lb. gauge for regular work. The Vernier for close reading. Both mounted in a Martin-Decker heavy steel box, directly in front of the driller. (Weight changes of as little as one hundred pounds on the bit are easily seen on the Vernier.)

One of the Crews that Drilled Plymouth No. 10

Reading left to right:

W. A. Ross	Lead Tongs
F. Franzen	Driller
J. J. Griffith	Tool Dresser
E. D. Zumwalt	Backup Man
W. J. Eowe	Derrick Man

CORPORATION

Formerly
Martin-Loomis Corporation

3433 Cherry Ave.
LONG BEACH
CALIFORNIA

WEIGHT RECORDING, MEASUREMENT AND CONTROL

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

East Texas

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Angelina	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Cass	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Harrison	1	13	...	...	1	13	...	...	...	...	5½	20	.....	.....
Marion	...	1	...	1	...	...	...	...	...	15	...	...	.....	.....
Panola	18	38	1	...	17	33	...	5	...	...	57¾	140	.....	.....
Rusk	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Wildcats	3	12	...	3	...	1	3	8	...	2,080	...	4	.....	.....
Total	23	66	1	4	18	47	4	15	...	2,095	63¼	164	.....	.....
Grand Total Texas	3370	3596	1798	1947	226	240	1346	1,409	1,037,445	2,225,651	4152	4,420	152,304,812	131,240,470
Total Texas, Outside Gulf Coast	2812	3124	1429	1644	200	225	1183	1,255	810,080	2,019,388	3316	3939	119,546,410	108,544,400

East Central

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Boggy Creek	...	3	...	1	...	...	...	2	...	20	...	...	661,650	542,550
Cedar Creek	...	1	...	1	...	...	...	...	...	75	...	...	.....	.....
Corsicana-Powell	...	...	...	...	...	...	...	...	...	...	...	...	1,124,050	1,550,850
Currie	...	...	...	...	...	...	...	...	...	...	...	...	59,350	84,400
Fannin	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Freestone	...	2	...	...	...	...	...	2	...	...	...	...	.....	.....
Henderson	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Limestone	1	5	1	...	...	...	...	5	10	...	...	...	.....	.....
Mexia	...	...	...	...	...	...	...	...	...	...	...	...	795,850	1,035,150
Milam	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Navarro	...	2	...	...	...	...	...	2	...	...	...	...	.....	.....
Nigger Creek	...	...	...	...	...	...	...	...	...	...	...	...	39,250	106,800
Richland	...	...	...	...	...	...	...	...	...	...	...	...	44,300	77,800
Van Zandt	40	1	40	...	...	...	...	1	160,850	...	...	...	2,717,600	.....
Wortham	...	...	...	...	...	...	...	...	...	...	...	...	160,300	219,750
Wildcats	43	1	...	...	...	...	43	1	...	...	...	...	.....	.....
Total	87	14	41	2	...	...	46	12	160,860	95	...	...	5,602,350	3,617,300

Southwest Texas

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Aqua Dulce	...	1	...	...	...	1	...	...	...	...	...	50	.....	.....
Atascosa	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Bastrop	10	...	1	...	...	...	9	...	10	...	...	...	.....	.....
Bee	5	...	2	...	1	...	2	...	511	...	1½	...	.....	.....
Bexar	7	...	2	...	...	...	5	...	13	...	...	...	.....	.....
Brooks	4	...	1	...	1	...	2	...	200	...	45	...	.....	.....
Caldwell	15	1	5	...	...	...	10	1	1,095	...	...	...	.....	.....
Cedar Creek	...	10	...	8	...	...	...	2	...	3,865	...	...	.....	.....
Cole	...	4	...	...	...	3	...	1	...	...	...	100	.....	.....
Dale	1	...	1	...	...	...	...	...	50	...	...	...	54,300	110,950
Darst Creek	174	...	157	...	...	...	17	...	280,766	...	...	...	3,430,300	.....
De Witt	3	...	...	...	...	...	3	...	...	...	...	...	.....	.....
Duval	25	26	12	17	8	8	5	1	1,265	3,705	215	227	.....	.....
Fayette	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Frio	2	1	...	...	...	...	2	1	...	...	...	...	.....	.....
Goliad	2	...	...	...	1	...	1	...	...	...	40	...	.....	.....
Gonzales	8	...	...	...	...	...	8	...	...	...	...	...	.....	.....
Guadalupe	11	...	1	...	...	...	10	...	2,000	...	...	...	.....	.....
Hays	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Jim Hogg	6	15	...	11	...	...	6	4	...	765	...	...	.....	.....
Karnes	5	...	...	...	...	...	5	...	...	...	...	...	.....	.....
Kendall	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Kerr	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Kinney	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Kleberg	2	1	...	...	1	...	1	1	...	...	...	...	.....	.....
Laredo District	...	...	...	...	...	...	...	...	...	...	...	...	1,547,350	2,103,650
Lavaca	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
La Salle	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Live Oak	2	1	...	...	...	...	2	1	...	...	...	...	.....	.....
Luling	...	...	...	...	...	...	...	...	...	...	...	...	1,802,300	2,240,550
Lytton Springs	...	2	...	...	...	...	...	2	...	...	...	...	158,200	181,000
Maverick	7	...	2	...	1	...	4	...	92	...	24	...	.....	.....
McMullen	3	...	...	...	...	...	3	...	...	...	...	...	.....	.....

*Millions of Cubic Feet.

(Continued on page 188)

YOU *make money*

so long as ◆ ◆ ◆ ◆ ◆ YOU MAKE HOLE

What Oil Men Have Been Looking For

There has been attained what practical oil men and engineers have long been seeking—a composition that increases the weight of rotary mud and at the same time stays in suspension.

◆ ◆ ◆

As conditions demand, OPALITE can be varied from 8 to 16 pounds per gallon.

Shipped in 80-pound Bags

Making Faster Hole Means Making More Money

Any oil field product has value in proportion to its contribution to the economics of drilling or producing oil. OPALITE fulfills this requirement to a high degree. Every contractor knows that he makes money so long as he is making hole. OPALITE saves the contractor money by increasing drilling efficiency.

Composition

OPALITE is the *only* product known that will increase the weight without affecting the flow. It is a natural product, mined and ground to 325 mesh, producing a paint-like mud for rotary drilling.

OPALITE has the desired chemical and physical properties which provide for the increasing of specific gravity to the desired point while at the same time maintaining suspension.

OPALITE ACTS AS A LUBRICANT, does not wear out, and quickly builds up circulation, thus thoroughly casing the hole, preventing gas blow outs.

LARGER COMPANIES STANDARDIZING ON OPALITE

The best proof of the value of any oil field product is its wide use by the more successful oil companies and contractors. OPALITE has practically a universal distribution among all the larger companies operating in the Gulf Coast Region.

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Barbers Hill, Texas: Turner's Rice Warehouse, Telephone 953F11.
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CORONA SILICA, INC.

Main Plant and Office: Rogers, Ark.

WEST TEXAS - The Land of Opportunity

An area rich in natural resources, WEST TEXAS offers advantages unsurpassed anywhere in the United States. Peopled by an intelligent citizenship that is ready to give encouragement to the further economical development of the territory.

Industrial and commercial expansion is keeping pace with the spread of the Oil Industry in WEST TEXAS. Today the opportunities of the section were never more promising for the establishment of new enterprises and the extension of trade territories.

Climatic conditions are favorable, abundant man-power is available and what is even more important a friendly spirit of co-operation pervades throughout the whole of WEST TEXAS.

Communications Are Invited From Those Interested

Please Address

WEST TEXAS CHAMBER OF COMMERCE

STAMFORD, TEXAS

Or Any Chamber of Commerce or Board of City Development in West Texas

On the Air

Each Monday evening at 9 o'clock the Houston National Bank presents the Houston National Players in historical playlets based on the life of General Sam Houston and the Houston National Concert Orchestra. Don't miss these programs; they are designed for your entertainment.

Are You In Tune With . . . . .

This Changing World?

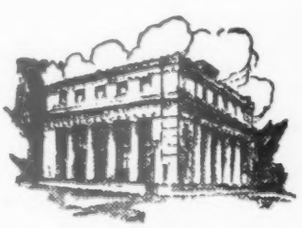
New Methods

Likewise has this era of unprecedented development brought new methods in banking. The older concepts are being tested — but this fundamental remains: A banking institution must possess and exercise a capacity for rendering personal attention to all the details of the business entrusted to it. The outstanding independence of the Houston National is a guarantee of continued devotion to this principle.

What would they have thought — those hardy pioneers who traveled across Texas in prairie schooners, drawn by straining oxen, could they have envisioned the marvels of this changing world? Dramatically new liners-of-the-highways, and winging liners-of-the-air portray and symbolize the swift changes time has wrought in the fifty-three years since the Houston National Bank was founded. The electric light, the telephone, the motor car, the motion picture, the steel-frame skyscraper, the radio, the dirigible — these and countless other marvels have altered our daily lives, our business habits, our whole economic structure.

HOUSTON NATIONAL BANK

Main at Franklin



MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

Southwest Texas—(*Continued*)

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Medina	8	...	...	...	1	...	7	...	...	...	40	...	.....	.....
Nueces	...	2	...	...	...	...	...	2	...	...	...	...	.....	.....
San Patricia	1	...	...	...	1	...	...	...	...	...	60	...	.....	.....
Salt Flat	8	174	8	156	...	3	...	15	1,610	73,544	...	50	4,443,250	6,309,100
Somerset	...	...	...	...	...	...	...	...	...	...	...	...	231,350	193,200
Starr	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Travis	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Val Verde	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Webb	20	44	7	16	5	17	8	11	820	3,455	190	488	.....	.....
Willacy	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Williamson	3	...	3	...	...	...	...	...	7,250	...	...	...	.....	.....
Wilson	4	...	...	...	...	...	4	...	...	...	...	...	.....	.....
Zapata	34	19	22	9	4	5	8	5	5,115	603	128	48	.....	.....
Zavalla	7	2	2	...	5	1	...	1	...	...	10	20	.....	.....
Others	...	...	...	...	...	..	..	..	..	..	..	..	375,100	705,950
Total	392	354	226	217	29	40	137	47	300,797	85,937	753½	983	12,042,150	11,844,400

Texas Gulf Coast

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Allen Dome	1	3	1	...	...	...	...	3	75	...	...	...	.....	.....
Barbers Hill	62	24	56	18	...	...	6	6	46,039	26,140	...	...	4,175,400	1,218,750
Baston	14	21	10	18	...	...	4	3	88	339	...	...	219,600	264,950
Big Creek	6	15	3	12	...	...	3	3	2,462	15,145	...	...	742,350	619,150
Big Hill	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Blue Ridge	12	33	10	28	...	...	2	5	1,634	15,895	...	...	339,450	723,500
Boling	1	12	...	3	...	...	1	9	...	2,915	...	...	197,200	360,300
Brenham	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Clay Creek	9	11	5	7	1	...	3	4	545	5,560	2	...	300,150	.....
Clemems Dome	...	2	...	...	...	...	...	2	...	...	...	...	.....	.....
Clodine	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Damon Mound	3	1	1	...	...	...	2	1	500	...	...	...	101,700	142,450
Danbury	1	...	1	...	...	...	...	...	35	...	...	...	.....	.....
Davis Hill	...	1	...	...	...	...	...	...	...	...	...	...	.....	.....
Edna	...	1	...	...	...	1	...	...	...	...	...	20	.....	.....
Esperson Dome	15	...	11	...	2	...	2	...	7,285	...	18	...	288,350	.....
Eureka	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Fannett	4	4	2	3	...	...	2	1	1,600	3,800	...	...	229,900	.....
Genoa	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Goose Creek	5	12	3	9	...	...	2	3	595	855	...	...	862,250	1,122,750
Hankamer	5	1	4	1	...	...	1	...	4,420	700	...	...	65,050	.....
High Island	4	7	4	4	...	...	...	3	6,642	438	...	...	.....	.....
Hull	24	25	21	22	...	...	3	3	9,245	9,210	...	...	1,690,150	1,733,300
Humble	47	7	36	7	1	...	10	...	41,472	21,193	10	...	3,224,100	1,126,200
Long Point	...	2	...	...	...	...	...	2	...	...	...	...	.....	.....
Lost Lake	9	3	3	...	...	1	6	2	760	...	...	40	.....	.....
Moores Field	3	2	3	1	...	...	...	1	3,750	800	...	...	.....	.....
Moss Bluff	1	2	1	...	...	...	...	2	800	...	...	...	.....	.....
Mykawa	5	1	1	...	...	...	4	1	100	...	...	...	.....	.....
Nash Dome	1	3	...	2	...	...	1	1	...	1,200	...	...	.....	.....
North Dayton	2	1	2	...	...	...	...	1	3,950	...	...	...	239,700	.....
Nursery	1	2	...	...	1	...	...	2	...	...	1	...	.....	.....
Orange	4	13	4	10	...	...	...	3	180	1,263	...	...	433,350	543,050
Orchard	...	...	...	...	...	...	...	...	...	...	...	...	72,550	.....
Pettus	18	...	8	...	2	...	8	...	5,400	...	45	...	215,450	.....
Pierce Junction	32	46	19	36	...	1	13	9	13,690	35,185	...	...	1,951,150	2,634,720
Pilant Lake	...	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Port Neches	...	1	1	1	...	...	...	...	200	1,900	...	...	361,952	.....
Raccoon Bend	14	22	12	17	1	2	1	3	2,378	6,428	4	6½	1,856,200	577,950
Refugio	111	23	81	11	15	9	15	3	45,939	4,945	695	415	6,409,600	.....
San Felipe	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Saratoga	9	8	6	5	...	...	3	3	157	205	...	...	186,900	167,300
Sour Lake	15	7	9	6	...	...	6	1	159	108	...	...	428,950	506,850
South Liberty	11	67	8	53	...	...	3	14	3,640	19,014	...	...	960,800	1,126,200
Spindle Top	46	14	31	11	2	...	13	3	18,322	12,995	60	...	3,095,700	5,652,300
Stratton Ridge	...	1	...	...	...	...	...	1	...	...	...	...	.....	.....
Sugar Land	12	14	11	14	1	...	...	...	5,083	15,800	1½	...	2,101,150	1,772,500
West Columbia	4	1	1	1	...	...	3	...	220	200	...	...	1,036,350	1,232,000
Washington County	...	2	...	1	...	...	...	1	...	5	...	...	.....	331,550
Wildcats	37	56	...	2	...	...	37	54	...	4,025	...	...	.....	.....
Others	...	...	...	...	...	...	...	...	...	...	...	...	972,950	840,300
Total	558	472	369	303	26	15	163	154	227,365	206,263	836½	481½	32,758,402	22,696,070

Arkansas

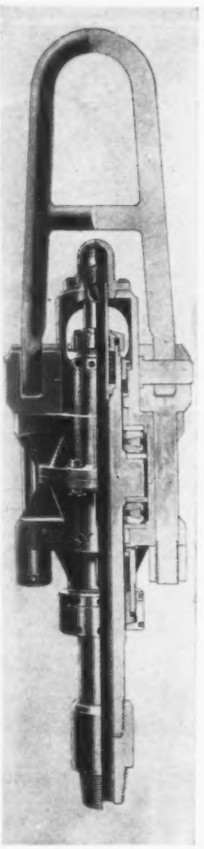
County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929
Ouachita	30	21	25	12	3	...	2	9	1,258	1,126	33	...
Union	33	75	27	42	1	9	5	24	656	13,734	35	115
Wildcats	33	58	12	11	1	3	20	44	870	591	25	12
Total	96	154	64	65	5	12	27	77	2,784	15,451	93	127

GRAY
DRILLING and FISHING
TOOLS

The Gray Tool Company is an organization DEDICATED to careful and superior workmanship . . . in originating tools to eliminate troubles that constantly confront the oil operator . . . to improve tools already in use . . . to work with the oil man who is actually engaged in oil production; with oil companies, the production men of which are intelligently striving for safer, surer, and quicker methods.

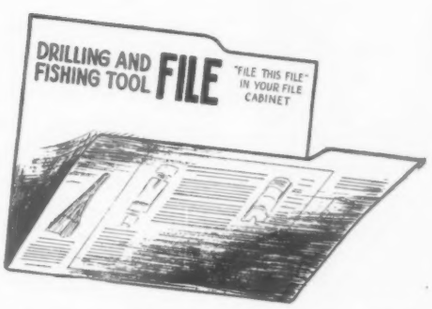
The Gray Heavy Duty Swivel is designed and built to carry, with a large factor of safety, the heaviest loads encountered in drilling.

The Gray Back Up Tool is a strong, practical, economical tool for backing up string of casing while top joint is unscrewed for spacing and nippling up.



This cross-section of the *Gray Swivel* shows to advantage its sturdy construction.

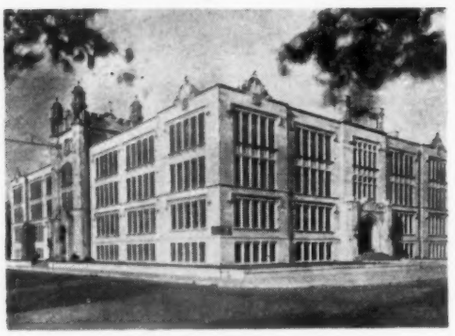
The Gray Packer Type Release Spear provides a simple, positive means for packing between the tool and inside wall of the fish, allowing circulation to be forced to the bottom of and around a stuck string.



Gray Box Taps are designed in a series of sizes, which enables the supplying of your needs without using too steep a taper, or making the tool so long that price would be excessive.

Send for "Drilling and Fishing Tool File"

GRAY
TOOL COMPANY
HOUSTON – TEXAS



Top view: Central High School—one of three senior high schools.
Center: The Skirvin Hotel conveniently located near the retail and wholesale districts.
Lower view: A typical street scene in one of Oklahoma City's residential sections.

The agricultural, manufacturing, distributing, governmental, railroad, financial and educational center of Oklahoma wants you as a citizen.

With a 1930 population of 182,845, Oklahoma City is the center upon which converge all the interest and activities of this true wonder state of the great Southwest.

In it, a home is completed on an average of every hour of each working day . . . building permits in 1929 amounted to $24,158,635, an increase of 33-1/3% over the previous year . . . a $30,000,000 building program for 1930 is well on its way to completion.

There are 54 public schools and 35 private and denominational institutions of learning in the city with a total enrollment of 44,702 and a total value of school property of $17,826,163. Oklahoma City University, with an enrollment of 1500 is located in the city itself while only 18 miles away, at Norman, is located the state university with an annual enrollment of 8,000 students.

2300 acres of public parks and playgrounds provide for the recreation of the entire family and 118 churches, owning property valued at $9,000,000, make Oklahoma City the religious center of the state.

There are now many fine hotels in the city, with contracts already let and work started on two more, one of twenty-five and one of sixteen stories. This provides ample facilities, not only for the traveling public but also for those who wish to make use of hotel accommodations until a permanent home is established here.

These are but a few of the reasons why Oklahoma City folks like to live in Oklahoma City . . . and why you, too, will find a genuine joy in living here.

BYLLESBY
OKLAHOMA GAS AND ELECTRIC COMPANY
PIONEERS IN PUBLIC SERVICE

MA CITY

Its electric power supply has always kept ahead of the ever increasing growth in population and its indusrtial progress, through the state's largest interconnected power plant and transmission line system.

Oklahoma City's 1,250 wholesale and distributing houses with an annual business volume of $418,000,000 . . . its 553 manufacturing plants with an output of $208,000,000 . . . and its 2,110 retail stores with a yearly business of $160,000,000 spell PROGRESS.

. . . and it is this progress with which the Oklahoma Gas and Electric Company is proud to be identified.

Anticipating future development, a new 40,000 H. P. generating plant is nearing completion in the city, which will be connected directly to the Oklahoma City distribution system through a large sub-station and high voltage lines.

A general extension of the Oklahoma City underground construction system in the downtown business area is also included in the 1930 program of "Building Today for a Greater Oklahoma Tomorrow."

And in the oil field which finally tamed the Wild Mary Sudik, electric power has been keeping pace with progress. Approximately 85 per cent of all the oil produced in the Oklahoma City area is pumped away to refineries or main pipe lines with electric driven pumps. All gasoline absorption plants in the Oklahoma City area, 14 in number, producing approximately 10,000 barrels a day, are electrified.

Truly, this is progress. It is the spirit of youth and adventure. It is beckoning you to join it. We'll be glad to tell you more about it if you'll write.

OKLAHOMA GAS *and* ELECTRIC COMPANY

J. F. Owens Vice President and General Manager

Courteous Personal Attention to Every Customer

Top view: The office building owned and occupied entirely by the Oklahoma Gas and Electric Company.
Center: The Oklahoma City generating plant located in Belle Isle Park.
Below: One of the Centrifugal Pump Stations located in the Oklahoma City oil field.

MID-YEAR FIELD STATISTICAL REVIEW
First Six Months 1930

North Louisiana

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Bellevue	...	...	...	...	...	...	...	...	...	...	...	...	56,800	123,050
Bossier	10	14	6	1	3	4	1	9	262	5	41	9	.....	.....
Caddo	34	38	27	19	3	3	4	16	1,946	952	32	56	2,242,500	2,102,950
Carterville	...	...	...	...	...	...	...	...	...	...	...	...	309,650	.....
Claiborne	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Cotton Valley	1	...	...	...	1	...	...	...	...	...	32	...	401,850	335,450
De Soto	...	15	...	4	...	3	...	8	...	145	...	3½	543,050	709,200
Elm Grove	...	...	...	...	...	...	...	...	...	...	...	...	43,450	110,150
Haynesville	...	...	...	...	...	...	...	...	...	...	...	...	834,750	971,950
Holly	...	...	...	...	...	...	...	...	...	...	...	...	107,750	.....
Homer	...	...	...	...	...	...	...	...	...	...	...	...	650,850	727,650
La Salle	8	10	2	5	...	...	6	5	45	530	...	...	.....	.....
Morehouse	10	19	...	...	10	17	...	2	234	...	...	...	.....	.....
Ouachita	27	38	...	1	24	37	3	...	...	19	117	961	.....	.....
Pleasant Hill	4	...	4	...	...	...	...	...	165	...	...	...	74,750	86,300
Red River	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Richland	43	19	1	...	39	16	3	3	20	...	2052	571	.....	.....
Sabine	4	6	2	2	...	1	2	3	185	25	...	2½	.....	.....
Union	13	9	...	...	12	9	1	...	...	...	45	54¾	.....	.....
Urania	...	...	...	...	...	...	...	...	...	...	...	...	947,150	1,056,900
Webster	2	15	...	3	2	9	...	3	...	249	5	996½	.....	.....
Zwolle	...	...	...	...	...	...	...	...	...	...	...	...	729,150	.....
Wildcats	201	48	89	7	13	10	99	31	27,331	3,572	114	80¾	.....	.....
Others	...	...	...	...	...	...	...	...	...	...	...	...	370,850	43,450
Total	359	243	131	42	107	112	121	89	29,954	5,497	2,672	2,734	7,312,550	6,467,050

Louisiana Gulf Coast

County or Field	Completions		Producers		Gas Wells		Failures		Initial Production Oil		Initial Production Gas*		Annual Production	
	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	6 Mos. 1930	6 Mos. 1929	1930	1929
Anse La Butte	3	3	1	...	...	...	2	3	5	...	...	...	.....	.....
Bay Junop Dome	2	...	...	...	...	...	...	...	...	...	...	...	.....	.....
Bayou Bouillon	4	4	1	...	...	...	3	4	1,800	...	...	...	15,250	60,800
Bayou Blue Dome	6	1	4	...	...	...	2	1	680	...	...	...	.....	.....
Belle Isle	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Black Bayou	5	6	1	3	...	...	4	3	1,325	475	...	...	.....	.....
Caillon Island	1	...	1	...	...	...	...	...	1,100	...	...	...	.....	.....
Dog Lake Bayou	1	1	...	1	...	...	1	...	...	4	...	...	.....	.....
East Hackberry	8	9	4	5	...	...	4	4	2,876	3,175	...	...	331,950	742,450
Edgerly	9	8	4	6	...	...	5	2	102	510	...	...	111,050	156,850
Evangeline	8	12	3	7	...	...	5	5	3,510	5,445	...	...	226,650	217,400
Eunice	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Four Island Bayou	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Garden Island Bay Dome	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Glenwild	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Hackberry	9	34	3	23	...	...	6	11	1,600	8,845	...	...	249,450	313,950
Hager Dome	3	...	...	...	...	...	3	...	...	...	...	...	.....	.....
Iota	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Jefferson Island	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Johnson Bayou	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Lake Barre	1	...	1	...	...	...	...	...	2,050	...	...	...	20,100	.....
Lake Grand Ecaille	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Lake Pelt	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Lockport	7	10	5	7	1	...	1	3	1,520	3,250	...	...	527,350	753,550
Mallard Bay	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Napoleonville	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Patterson	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Pine Prairie	2	...	...	...	...	...	2	...	...	...	...	...	.....	.....
Port Barre	8	1	7	...	...	...	1	1	9,200	...	...	...	356,600	.....
Sorrento	2	3	1	...	...	...	1	3	300	...	...	...	24,150	92,100
South Calcasieu Lake	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
South Welch	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Starks Dome	19	4	5	2	...	...	14	2	830	190	...	...	.....	.....
Sulphur	8	12	5	3	...	...	3	9	10,205	3,300	...	...	841,750	441,600
Sweet Lake	1	2	1	2	...	...	...	...	75	460	...	...	11,400	90,350
Thibodeaux	1	5	...	...	...	...	1	5	...	...	...	...	.....	.....
Vermilion Bay	1	1	...	...	...	...	1	1	...	...	...	...	.....	.....
Vinton	9	13	7	10	...	...	2	3	5,962	4,685	...	...	760,700	762,650
Welch	1	...	1	...	...	...	...	...	15	...	...	...	.....	.....
White Castle	1	...	1	...	...	...	...	...	1,200	...	...	...	.....	.....
Wisner	1	...	...	...	...	...	1	...	...	...	...	...	.....	.....
Wildcats	5	10	...	1	...	...	5	9	...	65	...	...	.....	.....
Others	...	...	...	...	...	...	...	...	...	...	...	...	386,050	109,850
Total	143	148	56	70	1	...	86	77	44,355	30,404	...	...	3,862,450	3,741,550
Total Louisiana	502	391	187	112	108	113	207	166	74,309	35,901	2,672	...	11,175,000	10,208,600

*Millions of Cubic Feet.

EVERY OIL MAN
Get Information on this . . .

This hose now being adopted by all major oil companies as standard equipment. Sold through all supply houses.

NOW DRILLING HOSE TROUBLES ELIMINATED BY HAMER ALL STEEL ROTARY HOSE

A steel rotary hose that swivels in all directions and cannot get in a bind in any position, as all the sections of pipe revolve independent of the joint itself. Absolutely guaranteed to stand all pressures that drilling equipment pumps can put up. Made of drill pipe and steel casting; the strongest hose on earth.

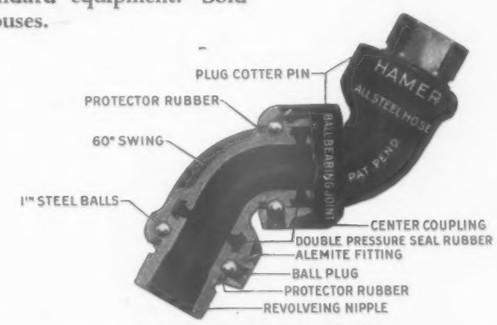
Works perfectly in a rat-hole or finger board position. Swings freely for every position, and it will eliminate all of your hose troubles. It is more flexible than a rubber hose. Weighs very little more than a high grade pressure rubber hose. It is the safest hose to cement wells with.

An added safety feature is a cable running through the hose, or outside if desired, from end to end—one end tied to derrick leg, the other end to swivel.

Stands 2500 lbs. Working Pressure

Fluid passage not obstructed. High pressure does not effect its flexibility. Hole through joint larger than pipe. Will stand 2500 pounds working pressure without danger of a blow-up. Write for facts NOW.

MAIL TODAY



ALL STEEL ROTARY JOINT

Has all of the different features that it takes to overcome the steel hose troubles heretofore encountered. It is flexible, strong, simple and light. Permits hose to be swiveled in enough directions to be satisfactory for all positions that a hose must be put into.

Clearance of fluid passage through the joint is larger than that of the hose itself.

OTHER HAMER PRODUCTS

- Imperial Oil Savers
- E-Z Out Liner Packing Rings
- Stop Cocks
- Pump Valves
- Pump Pistons
- E-Z Out Valve Seat

. . . . New *folder just out*

. . . giving record of results

Mail NOW

(Clip Coupon here)

Date .....

THE THRIFT CORPORATION
Post Office Box 1540, HOUSTON, TEXAS

Send me folder showing why Hamer All Steel Rotary Hose eliminates drilling hose troubles and why major oil companies are fast standardizing on it.

Name .....

Address .....

OKLAHOMA, KANSAS, ARKANSAS, CALIFORNIA, AND MOUNTAIN STATES PRODUCTION

Details First Six Months 1930

KANSAS

	Barrels 1930	Barrels 1929
Greenwood	3,542,063	3,866,600
Florence	151,450	173,000
Peabody	574,000	532,450
El Dorado	2,481,600	2,256,800
August-Fox-Bush	535,050	531,450
Rainbow Bend	198,900	188,700
Voshell	2,089,100	.....
Russell	629,450	600,050
Churchill	792,950	1,260,800
Oxford	524,700	973,550
Sedgwick	3,901,100	3,406,000
Others	6,357,350	5,252,470
Total	21,793,463	19,041,870

ARKANSAS

	Barrels 1930	Barrels 1929
El Dorado	741,700	846,700
Champagnolle	830,500	1,667,450
Smackover-Light	956,350	1,155,200
Smackover-Heavy	7,257,850	8,968,750
Stephens	173,350	182,750
Nevada	187,850	222,300
Lisbon	190,250	258,350
Others	96,250	18,100
Total	10,434,200	13,382,050

OKLAHOMA

	Barrels 1930	Barrels 1929
Braman	640,600	641,500
Blackwell	615,800	691,850
Hubbard	291,400	357,150
Thomas	112,600	164,800
Tonkawa	1,447,450	1,897,850
Garber	833,550	1,058,000
Burbank	3,010,750	3,945,000
Osage	4,795,350	4,627,650
Cushing	2,592,600	3,678,400
Yale	1,555,350	1,317,960
Davenport	185,150	282,800
Bristow	3,007,150	349,950
North Okmulgee	1,961,500	2,523,800
South Okmulgee	1,182,950	1,438,400
Cromwell	1,361,400	1,442,100
Papoose	521,650	620,110
Wewoka	704,000	896,650
Seminole	3,947,650	6,388,950
East Seminole	667,550	5,350
Bowlegs	3,950,450	6,680,600
Searight	1,753,200	1,897,800
Little River	7,497,600	14,884,800
East Little River	3,176,550	.....
Earlsboro	6,346,800	11,183,450
East Earlsboro	7,497,800	.....
Duncan	1,461,750	1,244,200
Konowa	1,739,400	.....
Graham	655,700	792,550
Fox	225,600	264,050
Healdton	2,188,900	2,386,600
Hewitt	1,324,550	1,514,600
Scholem-Alechem	2,483,300	2,380,950
Pearson	131,210	338,700
Oklahoma City	17,054,150	773,500
Mission	2,296,150	3,217,550
Carr City	1,602,350	109,650
Asher	400,000	.....
West Asher	87,650	.....
Sasakwa	1,931,400	.....
St. Louis	7,196,150	18,991,950
Allen	3,826,600	4,718,650
Maud	1,057,700	5,420,400
Logan County	1,606,550	2,358,900
South Earlsboro	356,650	.....
Others	11,033,600	9,945,200
Total	118,993,060	121,432,370

CALIFORNIA

	Barrels 1930	Barrels 1929
Inglewood	3,947,100	4,558,100
Midway-Sunset	12,867,500	12,710,500
Ventura	8,907,000	10,137,700
Seal Beach	4,592,000	6,906,500
Elwood-Goleta	7,479,800	4,331,600
Kettleman Hills	2,529,400	609,900
Santa Fe Springs	26,086,400	32,494,000
Long Beach	18,449,100	32,603,000
Huntington Beach	6,033,000	8,210,100
Dominguez	1,799,500	1,828,200
Others	27,309,800	22,924,750
Total	119,899,600	141,054,450

WYOMING

	Barrels 1930	Barrels 1929
Salt Creek	5,349,800	5,711,500
Grass Creek	379,300	410,400
Elk Basin	132,850	145,950
Big Muddy	371,250	489,700
Lost Soldier	521,850	619,450
Rock Creek	403,850	430,900
Lance Creek	30,450	51,300
Oregon Basin	816,350	547,230
La Barge	385,350	269,100
Others	688,200	711,050
Total	9,078,100	9,386,580

MONTANA

	Barrels 1930	Barrels 1929
Cat Creek	218,900	256,100
Sunburst	1,048,550	1,131,850
Pondera	383,300	495,800
Others	11,400	10,600
Total	1,662,150	1,894,350

COLORADO

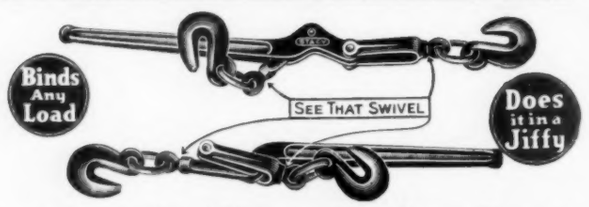
	Barrels 1930	Barrels 1929
Moffats	194,700	219,750
Fort Collins	269,650	455,000
Florence	113,750	197,850
Others	275,950	384,800
Total	852,050	1,257,400

NEW MEXICO

	Barrels 1930	Barrels 1929
Table Mesa	18,200	23,100
Artesia	134,900	170,450
Hog Back	77,200	66,550
Rattlesnake	181,850	141,250
Lea & Eddy	1,878,450	.....
Others	163,800	50,150
Total	2,453,300	451,500
Total Rocky Mountain States	14,045,600	12,989,830

"BOOMERS"

Stacy Swivel Load Binders



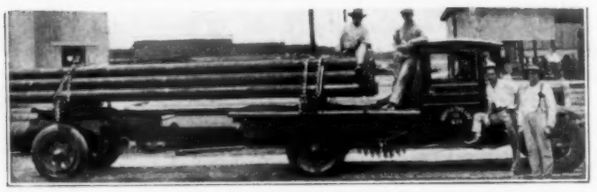
A Handy Time-Saving Tool

Stacy Swivel Load Binders have many practical Oil Field uses. They make hauling safe and save time and work by binding any load quickly, easily, securely. No load is too big or too heavy for this indispensable tool. Photograph below shows how the Stacy Binder holds a pipe welding clamp firm. Made in 5 sizes, weighing from 2 lbs. to 14 lbs. for each single tool, not for a pair as commonly quoted, sold and used.

Used in Every Oil Field in the World

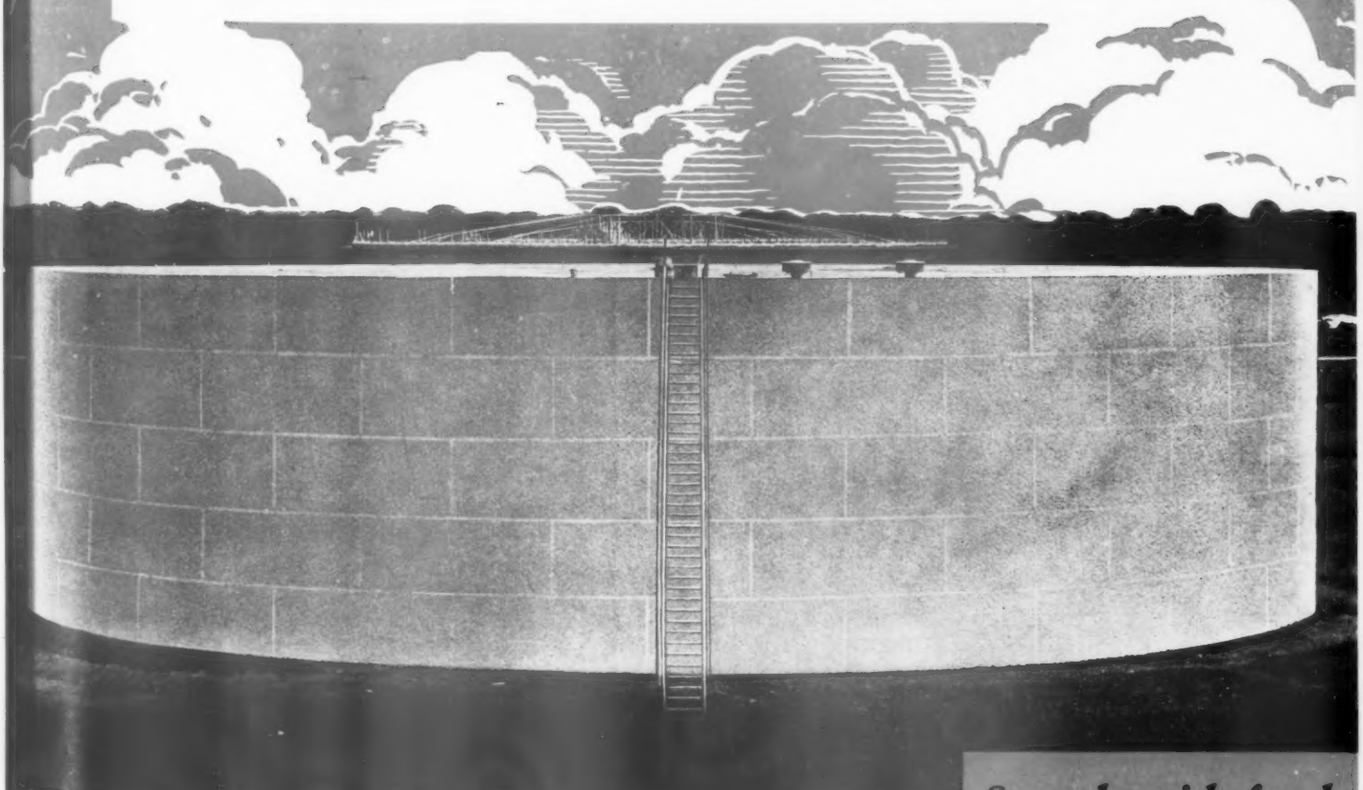
Just ask your jobber or export agent for Stacy Load Binders in the size you want. He'll do the rest. I also sell chains. Any weight, size or length with hooks or as desired.

EUGENE C. STACY, Manufacturer, Tiffin, Ohio., U.S.A.



Reduce Your FIRE HAZARD with WIGGINS ROOFS

Paid for out of OIL EVAPORATION SAVINGS



The tank in the foreground is equipped with a Wiggins Breather Roof and the one immediately behind has a Wiggins Floating Roof. Any new tank, or old one in good condition, can be equipped with a Wiggins Roof.

See other side for details of fire tests on WIGGINS ROOFS

Tests prove WIGGINS ROOFS eliminate fire hazard in oil tanks

On Working Tanks

Wiggins Floating Roofs are in use all over the world by oil companies—for fire protection, for stopping evaporation losses, or both. By stopping evaporation losses which are common to ordinary cone roofed tanks; Wiggins Roofs save their cost in a short time, so that the effective fire protection they provide is practically free.

Tests conducted by an oil company now using over a hundred Floating Roofs prove their value in preventing fire. Gasoline was burned on top of a Wiggins Roof riding on two feet of gasoline without igniting the gasoline in the tank. Three other tests under varying conditions were equally successful. It is a significant fact that all the companies making fire tests on Wiggins Roofs have become large users. Fill out coupon for a bulletin describing fire tests more fully.

View of Fire Test Described

On Standing Storage

Oil vapor escaping from an ordinary tank—even when equipped with a "gas-tight" roof—mixes with air to form a highly inflammable mixture. Wiggins Breather Roofs eliminate such explosive mixtures because under all ordinary conditions, no air is taken in and no vapor is vented out.

This is particularly important when a thunder shower suddenly cools a tank on a hot day. While an ordinary tank draws in air through the vents and creates a highly combustible mixture just when lightning is most prevalent, the Wiggins Roof prevents such action. In actual service no lightning strike has ever resulted in the loss of a tank equipped with a Wiggins Roof. Send coupon for new booklet on Wiggins Breather Roofs.

Another fire test being made on Wiggins Roof

Re-Roof Existing Tanks

Protect all of your tankage from fire by having new installations completely equipped with WIGGINS ROOFS and by re-roofing existing tanks with them. Ordinarily the old cover is completely removed. Practically new low-pitch steel cone roofs can, however, be converted to Wiggins Breather Roofs.

Other Products

Storage Tanks—Standard capacities ranging from small refinery or marketing tanks to large field storage tanks.

Hortonspheres—Spherical tanks of 5,000 to 10,000 barrel capacity for storing light products under pressure.

Elevated Tanks—5,000 to 2,000,000 gallon capacity structures for water or other liquids.

Refinery Equipment — Including Agitators, Condenser Boxes, Absorbers, Stills, Bubble Towers, etc.

Use the coupon to ask for prices on any of these products

CHICAGO BRIDGE & IRON WORKS

Chicago	Dallas	San Francisco
New York	Cleveland	Philadelphia
Detroit	Boston	Birmingham

Chicago Bridge & Iron Works
Old Colony Bldg., Chicago, Illinois

Gentlemen:

Please send full information on

_____

Name _____

Company _____

Address _____

City _____ State _____

WIGGINS ROOF
Stop EVAPORATION LOSS

Pipe Line Construction in 1930, Actual and Proposed

Company—	Field or area served	Other terminus	Kind	Size of Pipe	Length (Miles)	kind of joints	Number of stations	Date started	Date completed
Ajax Pipe Line Co.	Glen Pool	Alton, Illinois	oil	Two 10″	450	welded	12		(building)
Atlantic Pipe Line Company	Hobbs, New Mexico	Midland, Texas	oil	8″	79	welded	1	6-3-30	6-23-30
Arkansas-Louisiana Pipe Line Co.	Bernice, Louisiana	Rustin (trunk)	gas	2″	25	welded	.	3-3-30	5-5-30
Arkansas-Louisiana Pipe Line Co.	Carlisle, Arkansas	St. Louis (trunk)	gas	4″	3¼	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Dardanelle, Arkansas	St. Louis (trunk)	gas	4″	3	welded	.	....	....
Arkansas-Louisiana Pipe Line Co.	England, Arkansas	St. Louis (trunk)	gas	4″	7	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Hamburg, Arkansas	St. Louis (trunk)	gas	4″	8¼	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Lonoke, Arkansas	St. Louis (trunk)	gas	3″	7½	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Stuttgart, Arkansas	St. Louis (trunk)	gas	6″	14	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Star City, Arkansas	St. Louis (trunk)	gas	3″	6¼	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Warren, Arkansas	St. Louis (trunk)	gas	4″	8¼	coupled	.	....	....
Arkansas-Louisiana Pipe Line Co.	Monticello, Arkansas	St. Louis (trunk)	gas	4″	7	coupled	.	....	....
Burford Oil Company	Judkins	Wink	oil	4″	35	screw	1	2-4-30	3-1-30
Chapman Pipe Line Company	Chapman	Thrall	oil	2″	8	screw	1	3-30	6-30
Chapman Pipe Line Company	Chapman	Thrall	oil	4″	7½	screw	1	7-30	(building)
Chapman Pipe Line Company	Thrall	Taylor	oil	4″	9½	screw	1	(proposed)	....
Cities Service	Oklahoma City	Perry	Nat gas	24″	50	welded	2		(completed)
Continental Construction Company	Moore County, Texas, via Meade, Kansas, Plattsmouth, Nebraska, and Muscatine, Iowa, to point so. of Chicago.		gas	24″	1300	w and c			(materials enroute)
Drumheller, et al.	Cut Bank field	Cut Bank	gas	.	8	....	.	....	7-1-30
Empire Pipe Line Co.	Oklahoma City	Cimmaron	oil	8″	32	welded	1		(completed)
Great Lakes Pipe Line Co.	Barnsdall	Chicago and Minn.	gas	8″	1350	welded	.		(being surveyed)
Gulf Pipe Line Company	Darst Creek, Guadalupe Co.	Sour Lake	oil	8″	200	double-bell, welded	1	5-20-30	8-15-30
Gulf Pipe Line Company	Salt Flat, Caldwell Co.	Darst Creek-Sour Lake trunk line	oil	6″	10	....	.	....	....
Gulf Pipe Line Company	Hankamer, Liberty Co.	Sour Lake	oil	8″	20	double-bell, welded	1	3-20-30	4-30
Gulf-Union Pipe Line Co.	Perryman	Pittsburg, Cincinnati and Toledo	oil	8″ & 6″	1250	welded	.		(building)
Houston Pipe Line Company	Refugio	Trunk line at Fannin	gas	12″	25½	coupled	.	6-10-30	7-15-30
Houston Pipe Line Company	....	Palacios	gas	4″	16	couple-welded	.	6-30-10	6-30
Houston Pipe Line Company	....	Long Point, Fort Bend Co.	gas	12½″	13	coupled	.	11-29	2-30
Humble Pipe Line Co.	Hobbs	Jal	oil	8″	40	welded	1	3-27-30	5-7-30
Humble Pipe Line Company	Judkins	Crane County	oil	6″	15	welded	1	3-1-30	4-1-30
Humble Pipe Line Company	Taylor-Link	Yates	oil	6″	18	screw	1	9-29	9-29
Humble Pipe Line Company	Refugio	Ingleside	oil	8″	28	screw	1	3-10-30	5-1-30
Humble Pipe Line Company	Humble, Harris Co.	Baytown	oil	4″	20	screw	1	3-30	4-30
Illinois Pipe Line Co.	Border	Sweetgrass	oil	3″&4″	6½	screw pipe	.	2-30	4-30
Illinois Pipe Line Co.	Osage	Clay-Spur	oil	3″	13¼	screw pipe	1	4-30	7-30
Landreth Production Corporation	Taylor-Link	McCamey	oil	8″	14	welded	1	11-29	12-29
Louisiana Oil Refining Corporation	Darst Creek	Sullivan	oil	6″	3½	screw	.	5-30	5-30
Magnolia Pipe Line Company	Electra	Sigler field	oil	6″	17	screw	1	3-15-30	4-30
Magnolia Pipe Line Co.	Oklahoma City	Gray	oil	8″	26	welded	1		(completed)
Magnolia Pipe Line Company	Judkins	trunk line	oil	6″	10	screw	1	2-24-30	3-3-30
Magnolia Pipe Line Company	Hobbs	Wink	oil	8″	70	welded	1	(proposed)	....
Maple Leaf Refining Co.	Border	Coutts	oil	4″	7	....	.	2-30	4-30
Missouri-Kansas Pipe Line Co.	Stinnett (Panhandle)	to Madisonville, Kentucky							
Missouri-Kansas Pipe Line Co.	Stinnett	Liberal, Kansas	gas	22″	99	welded and screw	.	5-26-30	(building)
Missouri-Kansas Pipe Line Co.	Liberal	Newton, Kansas	gas	24″	209	w and c		(material enroute)	
Missouri-Kansas Pipe Line Co.	Newton	Louisburg, Kansas	gas	24″	141	w and c	.	7-30	(building)
Missouri-Kansas Pipe Line Co.	Louisburg	Boonville, Missouri	gas	22″	104	w and c	.	5-23-30	(building)
Missouri-Kansas Pipe Line Co.	Boonville	Springfield, Illinois	gas	22″	184	w and c		(materials enroute)	
Missouri-Kansas Pipe Line Co.	Springfield	Indianapolis	gas	20″	197	w and c		(materials enroute)	
Missouri-Kansas Pipe Line Co.	N. of Terre Haute, Ind.	Evansville, Indiana	gas	12″	133	w and c	.	(proposed)	....
Missouri-Kansas Pipe Line Co.	Evansville	Madisonville, Ky.	gas	10″	44	w and c	.	(proposed)	....
Missouri Valley Pipe Line Co.	Skellytown, Texas to Plattsmouth, Nebraska								
Missouri Valley Pipe Line Co.	Skellytown	Texas-Okla. border	gas	24″	80	coupled		(materials enroute)	
Missouri Valley Pipe Line Co.	Texas-Oklahoma line	Oklahoma-Kansas line	gas	24″	46	coupled	.	7-30	(building)
Missouri Valley Pipe Line Co.	Oklahoma-Kansas line	Ashland, Kansas	gas	24″	29	coupled	.	6-30	7-26-30
Missouri Valley Pipe Line Co.	Ashland	Clifton, Kansas	gas	24″	215	coupled		(materials enroute)	
Missouri Valley Pipe Line Co.	Clifton via Beatrice and Palmyra	Wabash, Nebraska	gas	24″	108	coupled	.	4-30	7-26-30
Missouri Valley Pipe Line Co.	near Palmyra	East Lincoln	gas	20″	9.08	coupled	.	7-30	(building)
Missouri Valley Pipe Line Co.	East Lincoln	Lincoln Gate Missouri River near	gas	12″	4¾	coupled	.	7-30	(building)
Missouri Valley Pipe Line Co.	Council Bluffs Junction	Council Bluffs, Iowa	gas	16″	14	Coupled		(materials enroute)	
Missouri Valley Pipe Line Co.	Leshara, Nebraska	Sioux City, Iowa	gas	16″	84	Coupled		(materials enroute)	

PIPE LINE CONSTRUCTION IN 1930, ACTUAL AND PROPOSED

Company—	Field or area served	Other terminus	Kind	Size of pipe	Length (miles)	Kind of joints	Number of stations	Date started	Date completed
Missouri Valley Pipe Line Co...	Clifton, Kansas, via Beatrice to east bank of Missouri River opposite Plattsmouth		gas	24″	135	Coupled		(materials enroute)	
Missouri Valley Pipe Line Co....	Wabash, Nebraska	Plattsmouth	gas	24″	23	Coupled	.	6-30	7-10-30
Missouri Valley Pipe Line Co....	Palmyra	Leshara, Nebraska	gas	20″	44½	Coupled		(materials enroute)	
Montana-Dakota	Cabin Creek	Bismark, N. D.	gas	12″	190	....	.	4-30	7-30
New Mexico Gas Co.	Clovis, N. M.	Hereford, Texas	gas	8″	60	....	.	11-29	4-30
New Mexico Gas Co.	Clovis	Portales	gas	6″	15	....	.	11-29	4-30
New Mexico Gas Co.	Clovis	Tucumcari	gas	6″	60	....	.	5-30	(building)
Oklahoma Pipe Line Co.	Oklahoma City	Cushing	oil	8″	52	welded	1		(completed)
Pacific Gas & Elec. Co. and Standard Oil Co.	Kettleman Hills	Richmond	gas	22″-24″ 26″	188	welded	1	11-29	6-30
Pacific Gas & Electric Co.	Vernalis Junction	Sacramento	gas	16″	80	welded	1	2-30	6-30
Pacific Gas & Electric Co.	Tracy Junction	Milpitas	gas	22″	37	welded	.	2-30	5-30
Pasotex Pipe Line Company.....	Wheat	trunk line	oil	4″	8	Screw	1	7-30	(building)
Phillips Petroleum Company....	LeFore-Pampa	Borger	oil	6″	32	Welded	1	1-3	3-10-30
Phillips Petroleum Company.....	Northern Moore Co. ..	Stinnett	oil	6″	17	Screw	1	7-30	(building)
Pondera Utilities	Kevin-Sunburst ..... branch	Valier	gas	.	15	....	.	....	2-21-30
Prairie Pipe Line Co.	Oklahoma City	Shawnee	oil	Two 8″	30	Welded	1		(completed)
Prairie Pipe Line Company.....	Voshell	Kansas station	oil	8″	35	welded	1		(completed)
Pure-Van Pipe Line Company....	Van	Chandler rack	oil	10″	20½	Welded	1	11-29	12-15-29
Pure-Van Pipe Line Company...	Chandler rack	Smiths Bluff	oil	10″	190	Welded	5	3-27-30	7-2-30
Pure Oil Pipe Line Co. of Texas..	Swastika	Turbeville *	oil	4″	11	Screw	.	2-30	3-30
Reagan County Pipe Line Company	Kemper	Big Lake	oil	6″	8½	Welded	.	11-1-29	11-27-29
Shamrock Oil & Gas Company	LeFore-Pampa	Phillips field station	oil	4″	16	Screw	1	3-30	4-30
Shell Pipe Line Co.	Hobbs	Eunice*							
Note: Atlantic Pipe Line Company's carrier to Hobbs carried under The Texas Company listing.									
Shell Pipe Line Co.	Oklahoma City	Ray	oil	6″	30	welded	1		(completed)
Shell Pipe Line Company.....	Voshell	Arkansas City	oil	4″	73	welded	2		(completed)
Sinclair Pipe Line Co.	Oklahoma City	Payson	oil	Two 10″	35	welded	1		(completed)
Skelly Oil Company	Voshell	Valley Center	oil	6″	40	welded	2		(completed)
Southern Natural Gas Corporation.	Monroe-Richland gas field	Atlanta, Georgia	gas	22″	500	.....	.	....	1-30
Southern California Gas Co.	Kettleman Hills	Buttonwillow	gas	20″	70	welded	.	11-29	1-30
Southern California Gas Co.	Kettleman Hills	Visalia	gas	8″	45	welded	.	11-29	1-30
Southern Union Gas Co.	Ute Dome	Puerco River	gas	8″	34	....	.	6-30	(building)
Southern Union Gas Co.	Puerco River	Cabezon	gas	10″	92	....	.	6-30	(building)
Southern Union Gas Co.	Cabezon	Albuquerque	gas	12″	53	....	.	6-30	(building)
Southern Union Gas Co.	Albuquerque	Belen	gas	6″	37	....	.	6-30	(building)
Southern Union Gas Co.	Albuquerque	Santa Fe	gas	8″	54	....	.	6-30	(building)
Southern Union Gas Co.	Santa Fe	Las Vegas	gas	6″	72	....	.	6-30	(building)
Standard Pipe Line Company of Louisiana	Cartersville, Louisiana .	Haynesville, Louisiana	oil	4″	12	screw pipe	1	6-1-30	(building)
Standard Pipe Line Company of Louisiana	Urbana, Arkansas	El Dorado	oil	6″	15	screw pipe	1	4-1-30	5-5-30
Standard Pipe Line Company of Louisiana	Holly, Louisiana	Oklahoma City (trunk)	oil	4″	4	screw pipe	.	....	....
Texas Empire Pipe Line	Lima, Okla.	Chicago and Lawrenceville	oil	12″ and 8″	755	welded and coupled	19		(completed)
Texas Gas Utilities Company.....	Chittim Ranch Maverick Co.	Del Rio	gas	10″	65	....	.	4-15-30	....
The Texas Pipe Line Company...	Rowan-Tong	McCamey	oil	6″	12	Coupled	1	10-29	10-29
The Texas Pipe Line Co.	Lea (Lynch) field	Jal	oil	6″	46	screw	1	7-29	9-1-29
Union Oil Company	Kettleman Hills	Avila	gas or oil	6″	81	welded	11	3-30	5-30
Waggoner Refining Company.....	Electra	Wichita Falls	oil	6″	28	Welded	1	1-30	2-22-30
Williamson County Pipe Line Co..	Chapman	Thrall	oil	4″	8¼	Screw	1	5-30	6-6-30
W. F. Brittain	Bannatyne	Collins	oil	3″	8	....	.	4-30	(not complete)

*Connects with The Texas Company's six-inch carrier.

Gasoline Pipe Lines in Texas

Humble Oil & Refining Company.	Yates	McCamey	25	4″		1	10-29	11-29
Magnolia Petroleum Company....	Luling	San Antonio	50	3″		1	3-8-30	4-10-30
Magnolia Petroleum Company....	Fort Worth	Dallas	31¼	3″		1	6-9-30	6-28-30
Phillips Pipe Line Company.....	Borger via Wichita, Kansas City to.....	St. Louis, Missouri	800	8″		10	....	(building)

Attempt To Cut Texas Back 125,000 Barrels

By H. J. STRUTH
Staff Economist

AUSTIN, Texas.—That Texas oil operators are more curtailment-minded than many seem to believe was evidenced Tuesday, July 29, when a special meeting was held here by the committee of producers and pipe lines of Texas in conjunction with representative operators, preparatory to the hearing called by the Railroad Commission for Wednesday, July 30.

Practically unanimous accord was voiced by producers' representatives on the need for immediate reduction of crude production in Texas, resulting in constructive suggestions as to curtailment necessary and possible within the respective districts.

As a result of this open meeting and the favorable expressions of sentiment voiced for operatives grouped in every section of Texas, members of the joint committee, including Robert R. Penn, chairman, David Donoghu, technical adviser; H. J. Struth, of THE OIL WEEKLY and Marion S. Church and John E. Kilgore, attorneys who framed the common purchaser bill, were able to prepare a summary of proposed curtailment by fields, for presentation to the Railroad Commission.

The report to be presented to the commission on Wednesday reads in part as follows:

"In view of the general situation which exists in the oil business in Texas, which condition has become more aggravated by recent events, and at the request of representatives of your body, representatives from the oil industry all over the state have endeavored to arrive at the fundamental causes of the present situation. These fundamental causes, as they appear to these representatives, are contained in the report and in further compliance with the request made by your honorable body, the report hereinafter contained suggests certain remedies which appear to these representatives to be necessary to alleviate conditions, which suggestions we wish considered only as suggestions.

No One Section Responsible

"The surplus production of petroleum over demand cannot be directly attributable to any given section or to any particular group within the state. Development of geophysical devices and new and improved drilling machinery enabling vastly deeper drilling than ever before has hastened the transformation of the business of refining and producing oil from a gambling basis to a scientific basis. New prolific pools have been discovered and developed by this new scientific method years in advance of their probable discovery by old methods. Improvements in methods of refining have enlarged the capacity of a barrel of petroleum to supply the demands of the consumers. Therefore if the future citizens of Texas are to have their share of the enjoyment of petroleum deposits as part of the natural resources of the state, it is incumbent upon your honorable body to exercise the powers vested in it through the legislature by the constitution to take care of these future generations to come and prevent the actual waste through reckless and profligate production of this great natural resource.

"Some fields within this state have been producing for many years and the production from these old wells is in such a condition that to enforce proration as against these wells would from a practical standpoint operate to destroy them. Other wells are producing such a quantity of water along with the oil that to curtail the operation of such wells would permit water encroachment to such an extent as to destroy the wells, and thereby in each instance forever destroy the amount of oil ultimately recoverable through such wells should they be continually operating.

"To destroy the amount of oil ultimately recoverable through any well now in operation is an actual waste. Many wells in the state are being operated solely from the view of producing oil therefrom and the gas which is being produced along with the oil is being permitted to escape and be actually wasted, because to conserve the gas thus being produced would result in a diminution of the oil being produced. Many wells are now being drilled with no hope but that the oil so produced will either be stored at a resulting waste, or become an additional burden to an already over-crowded market.

Rules and Regulations Necessary

"We suggest that adequate rules and regulations be continued in order to accomplish the following general outline of results:

"1. That a state-wide curtailment of the amount of oil which may be produced within this state be effected for a period of 90 days beginning August 1, 1930.

"2. That basis of such curtailment be defined specifically as to each field within this state taking into consideration the various facts and circumstances within each separate field.

"3. Since at your request a careful detailed survey of the situation as it exists at the present time has been made and from such survey it is indicated that a reduction of 75,000 barrels in daily production is now needed to meet the situation as it exists, and since in the opinion of the producers committees which have been working on this survey it is advisable to obtain not only the reduction necessary to balance demand, but an additional reduction of at least 50,000 barrels bringing a total curtailment of approximately 125,000 barrels below the daily average Texas production for June, we recommend that the specific daily production from each field or district be reduced and limited during such 90-day period to the following specific amounts: Panhandle 80,000 barrels, a reduction of 21,750 barrels; North Central Texas, 60,000 barrels, a reduction of 5450 barrels; West Central Texas, 52,000 barrels, a reduction of 3500 barrels; West Texas, 276,350 barrels, a reduction of 17,600 barrels; East Texas, 39,350 barrels, no reduction; Southwest Texas, 66,150 barrels, a reduction of 5250 barrels; Gulf Coast, 150,500 barrels, a reduction of 33,000 barrels."

Make Specific Recommendations

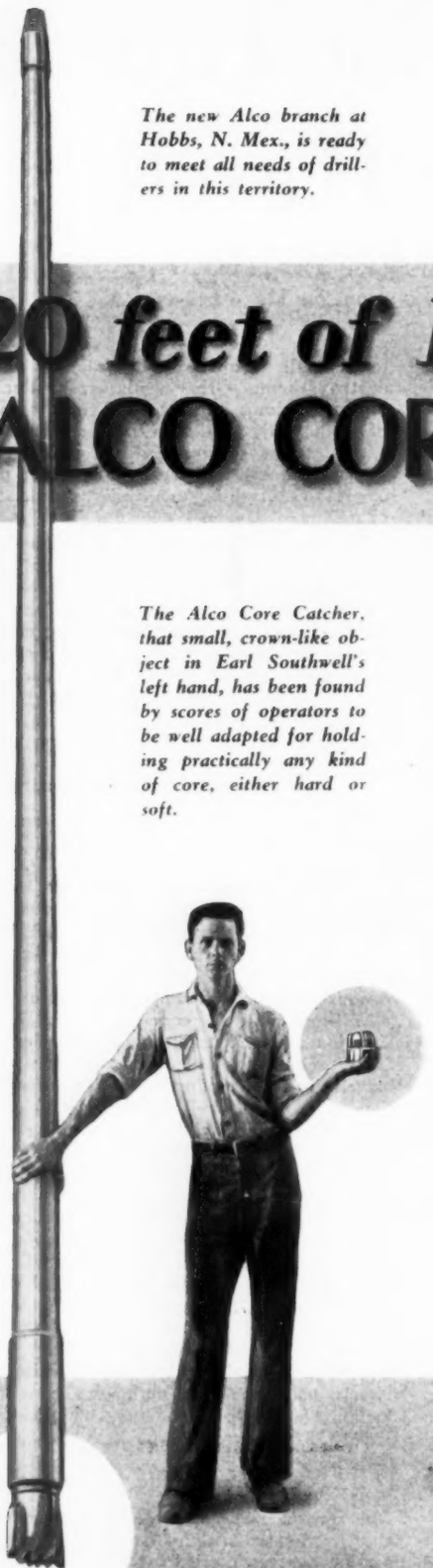
In several instances specific recommendations were made whereby the production of individual pools within the aforementioned areas carried a special recommendation for proration namely Crane-Upton Counties, a suggested reduction of one-third; Van Zandt field production not to exceed 25,000 barrels daily; Darst Creek field proration to be reinstated placing maximum outlet at 26,500 barrels; Salt Flat to be reduced 15,675 barrels; Escobas field recommended reduction of

(Continued on page 232)

The new Alco branch at Hobbs, N. Mex., is ready to meet all needs of drillers in this territory.

20 feet of Efficiency
ALCO CORE DRILL

The Alco Core Catcher, that small, crown-like object in Earl Southwell's left hand, has been found by scores of operators to be well adapted for holding practically any kind of core, either hard or soft.



Years of study and thorough understanding of coring requirements in all types of formation are behind every ALCO Core Drill. Every new condition in the taking of reliable cores has been reflected in the Alco Drill, until today the slogan "A core every time with an Alco" has real meaning to old time drillers.

ALCO Core Drills may be run at any depth and in any formation. One of the eight standard types will be found suitable for your purpose. Any Alco service man will be glad to advise with you as to the best one for your use.

Hole is made and reamed, the core trimmed and the drill centered in one operation—all the result of Alco's patented core drill head. Manufactured of highest grade materials and under regular Alco standards of rigid inspection.

Your inquiry will get quick action from any Alco branch.

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P. O. Box "A", Compton, California
Bakersfield · Maricopa · Ventura
Houston TEXAS
Oklahoma City OKLAHOMA

Markets--Production--Crude Prices

H. J. STRUTH, *Staff Economist, Houston, Texas*

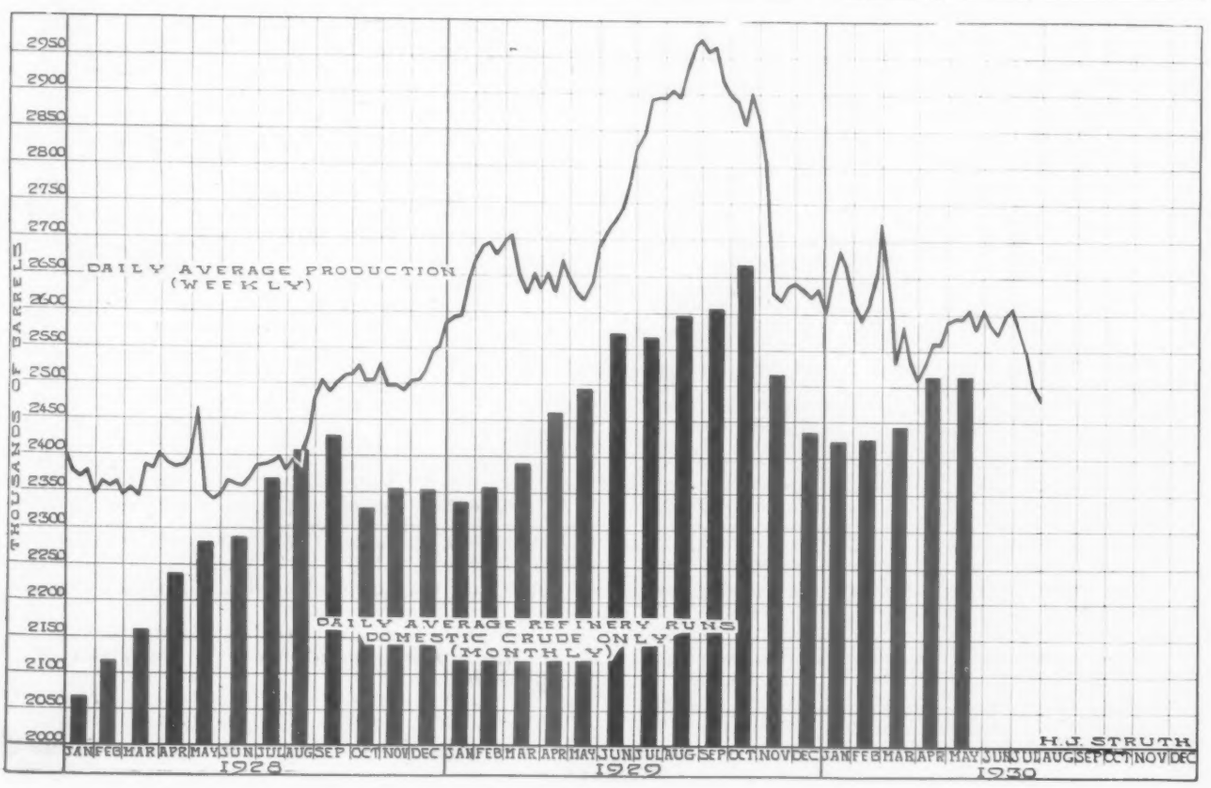
Further Decline in Crude Output; Refinery Runs Down

ANOTHER decline in daily production last week brought the curve still lower to the lowest point since December, 1928. The total for the past week was 11,300 barrels below the 2,500,000-barrel mark, and a decline from the previous week of 11,400 barrels. This continues the good work of last week when the production dropped to within 100 barrels above the 2,500,000-barrel mark, and is now more than 480,000 barrels below the high established in August, 1929. Absolute equilibrium, however, cannot be attained yet until another 90,000 barrels is curtailed.

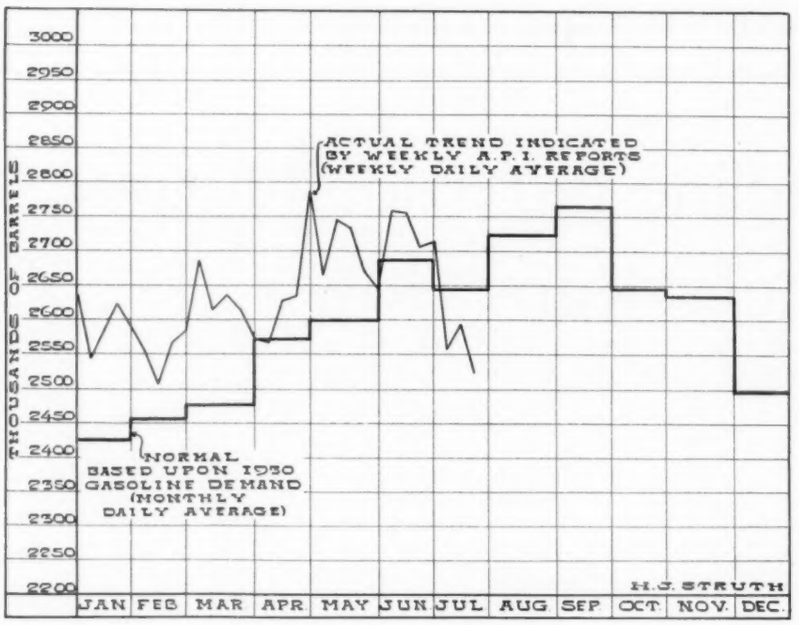
Production declines were recorded in Oklahoma, Arkansas, Eastern States, and California, aggregating 26,000 barrels, but increases were recorded in Kansas, Texas, North Louisiana and the Rocky Mountain States, aggregating 14,600 barrels. Decreases in Allen, St. Louis, South Earlsboro, East Earlsboro, Earlsboro, East Little River and Bowlegs, more than offset the increase at Oklahoma City, accounting for the decrease in Oklahoma's production of nearly 20,000 barrels. The small increase in Kansas' production was due to a slight recovery in production at Voshel, which was sharply lower last week.

Of the several Texas oil producing districts, the Texas Panhandle alone contributed a decline of approximately 5400 barrels, while increases were recorded in all other sections. West Texas contributed nearly 5000 barrels of the total, and Texas Gulf Coast more than 2000 barrels. North Louisiana registered an increase of 2750 barrels and the Rocky Mountain area 2400 barrels, while Arkansas and

DOMESTIC PRODUCTION AND REFINERY RUNS



RUNS OF CRUDE OIL TO STILLS



Eastern States recorded declines of 50 and 2500 barrels, respectively. California reported a decline of 4000 barrels.

Again, while production figures are favorably lower, particularly in California where an unfavorable market condition prevails, it has been necessary to revise the production quota to take care of recent revision in buying schedules. Oklahoma with a daily allowable of 550,000 barrels, got within 15,000 barrels of the figure set by the proration committee. This 565,000 barrels, however, represents a decline of 20,000 barrels under the figure reported for that state a week ago, and indications show that the tendency is still downward. Those in charge of proration still expect to reach the 550,000-barrel mark. Until the production of the state is brought down to 550,000 barrels it will be impossible for pipe line concerns to take all oil from the settled fields of the state. Some relief has already been afforded certain pools by Prairie Pipe Line Company, which has more of these settled pool connections than any other concern. Purchasing concerns are changing connections and otherwise shifting their affairs temporarily in order to give settled pools full runs. It is common opinion that the price of Oklahoma crude will be upheld provided the 550,000-barrel figure is reached. On the other hand, should this figure not be reached, close close students of the market anticipate a reduction in crude prices.

Reducing Runs in Kansas

These same conditions apply to Kansas, which shows spots of unsettled market factors. Already crude purchases have been discontinued for the Shurr pool of Rice County where output was only 250 barrels daily from five wells. Now this has been discontinued. The Eastborough pool is to have two pipe lines from local refining plants. This has brought the question of proration into a doubtful state. The extent of Kansas production, however, is not known, and it may not reach a figure of any consequence. Efforts to raise refinery gasoline prices are being met with offers over August for gasoline at current quotations. The conditions seem to require time for correction, as surplus stocks, part of which have been offered at current prices, are too much to overcome immediately. The reduction in refinery runs will bear fruit whenever stocks are reduced.

California Some Improved

The situation in California has changed a little for the better with production now but 16,000 barrels above the allowable output of the state. The California gasoline retail market is slightly weaker, in that a number of small stations are still selling at 12½ to 17½ cents, against an official retail price of 19½ cents. The major companies are holding firmly to the higher price, with cheap gasoline coming from truck dealers, who are buying from various

CRUDE RUNS TO STILLS, GASOLINE AND GAS AND FUEL OIL STOCKS, WEEK ENDING JULY 19, 1930

(Figures in barrels of 42 gallons)

District—	Potential Daily Capacity	Potential Capacity Reporting Total	Potential Capacity Reporting Per Cent	Crude Runs to Stills Total	Crude Runs to Stills Daily Average	Crude Runs to Stills Per Cent Operated	Gasoline Stocks	Gas & Fuel Oil Stocks
East Coast	608,700	608,700	100.0	3,433,000	490,400	80.6	7,601,000	9,542,000
Appalachian	128,100	117,600	91.8	605,000	86,400	73.5	1,572,000	950,000
Indiana, Illinois, Kentucky	382,500	381,000	99.6	2,165,000	309,300	81.2	7,587,000	4,242,000
Oklahoma, Kansas, Missouri	462,200	415,700	89.9	1,880,000	268,600	64.6	4,009,000	4,722,000
Texas	788,000	712,700	90.4	3,792,000	541,700	76.0	6,747,000	10,338,000
Louisiana-Arkansas	270,600	262,000	96.8	1,200,000	171,400	65.4	2,082,000	1,880,000
Rocky Mountain	148,900	139,300	93.6	416,000	59,500	42.7	2,580,000	1,197,000
California	897,400	891,400	99.3	3,631,000	518,700	58.2	13,759,000	106,242,000
Total Week July 19	3,686,400	3,528,400	95.7	17,122,000	2,446,000	69.3	45,937,000	139,113,000
Total Week July 12	3,686,400	3,528,400	95.7	17,577,000	2,511,000	71.2	47,792,000	139,085,000
The total U. S. figures for last year, showing immediately below, are not comparable with this week's totals because of differences in percentage capacity reporting.								
Total July 20, 1929	3,339,100	3,035,200	90.9	18,089,100	2,584,200	85.1	*36,452,000	*136,960,000
The Texas and Louisiana Gulf Coastal Figures Shown Below Are Included Above in the Totals of Their Respective Districts.								
Texas Gulf Coast	526,500	526,500	100.0	2,750,000	392,900	74.6	5,582,000	7,290,000
Louisiana Gulf Coast	147,500	147,500	100.0	804,000	114,900	77.9	1,709,000	1,064,000

*Final Revised 1929.

sources, mostly from the smaller refineries. If this cut-price situation does not improve it is possible that another price-cutting war will be precipitated.

California's production has recorded successive decreases since the first week in July, when production was at its lowest point since June. At the rate of present decline, California's July production will average approximately 608,000 barrels, or almost down to the 600,000 allowable. This will compare very favorably with the figure for July, 1929, when the state averaged 874,850 barrels.

The necessity of lowering pipe line runs in Oklahoma, Kansas and North Texas, continues to act as a saving grace for the industry in these areas, since a widening margin between supply and demand should foreshadow crude price cuts.

While certain areas in Texas reported declines for the week, it is still evident that a coordinated effort is required to curtail still further because such small decreases have been overshadowed by an increase in the state outside the Gulf Coast of approximately 5600 barrels, making Texas' excess production now total approximately 35,000 barrels daily. This, together with the 50,000 barrels which must be added if definite action is to be taken by operators to reduce production, makes a total of 85,000 excess daily production.

Gasoline Stocks

Gasoline stocks continue to reflect the improvement in refinery still runs. On July 26, according to the American Petroleum Institute, gasoline stocks aggregated 44,751,000 barrels, a decline of 1,186,000 barrels over the previous week's figure. Runs to stills for the week ending July 26 aggregated 17,630,000 barrels. a daily average of 2,518,000 barrels, or a decline of approximately 38,000 barrels.

Following are the more important changes in crude production reported by the American Petroleum Institute for the week ending July 26:

		Barrels
Gray County	Decrease	5,350
Winkler County	Increase	4,000
Reagan County	Increase	2,450
Van Zandt Co.	Increase	2,000
Darst Creek	Increase	5,000
Barbers Hill	Increase	2,000
Refugio	Decrease	2,050
Carr City	Decrease	2,500
Bowlegs	Decrease	3,250
East Little River	Decrease	3,700
St. Louis	Decrease	2,250
Oklahoma City	Increase	3,300
Ventura Avenue	Decrease	2,500
Salt Creek	Increase	3,000

HOW LAST WEEK'S DAILY AVERAGE PRODUCTION COMPARES WITH NECESSARY AND NORMAL QUOTA LIMIT

	Necessary Daily Average 3rd Quarter 1930	Quota Limit Prescribed to Correct Previous Excesses	Actual Daily Average Week Ending July 26, 1930	Excess
Arkansas	62,431	62,431	555,450	—6,981
California	664,149	594,000	610,900	16,900
Kansas	120,222	105,554	117,050	11,496
Louisiana	60,116	58,749	68,600	9,906
Oklahoma	669,115	550,000*	566,850	16,850
Texas	839,361	792,621	829,150	36,529
Balance of U. S.	230,000	230,000	220,750	—9,250
Total	2,645,394	2,393,607	2,468,750	175,143

*Revised to meet lower purchasing schedules.

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

(Barrels of 42 gallons)

	Week Ended July 19	Week Ended July 12
AT ATLANTIC AND GULF COAST PORTS—		
Baltimore	207,000	231,000
Boston	105,000	7,000
New York	1,082,000	1,315,000
Philadelphia	387,000	338,000
Others	.....	"A" 348,000
Total	1,781,000	2,239,000
Daily Average	254,429	319,857
AT GULF COAST PORTS—		
Galveston District	53,000	.....
New Orleans and Baton Rouge	48,000	85,000
Port Arthur and Sabine District	.....	.....
Tampa	39,000	.....
Total	140,000	85,000
Daily Average	20,000	12,143
AT ALL UNITED STATES PORTS—		
Total	1,921,000	2,324,000
Daily Average	274,429	332,000
Daily Average Four Weeks Ending	283,786	287,643
Distribution of Total Imports Is As Follows:		
Crude	1,209,000	"A" 1,641,000
Gasoline	400,000	227,000
Gas Oil	63,000	.....
Fuel Oil	249,000	"A" 456,000
Total	1,921,000	2,324,000

"A"—Revised.

CALIFORNIA OIL RECEIPTS AT ATLANTIC AND GULF COAST PORTS

(Barrels of 42 gallons)

	Week Ended July 19	Week Ended July 12
AT ATLANTIC COAST PORTS—		
Baltimore	303,000	81,000
Boston	.....	.....
New York	388,000	298,000
Philadelphia	230,000	.....
Others	.....	.....
Total	921,000	379,000
Daily Average	131,571	54,143
AT GULF COAST PORTS—		
Total	.....	72,000
Daily Average	.....	10,286
AT ATLANTIC COAST PORTS—		
Total	921,000	451,000
Daily Average	131,571	64,429
Daily Average Four Weeks Ended	91,893	76,750
Distribution of Total California Oil Receipts Is As Follows:		
Gasoline	921,000	451,000

Summarized Review of Field Results

State—	Completions This week	Completions Last week	Oil Wells This week	Oil Wells Last week	Gas Wells This week	Gas Wells Last week	Failures This week	Failures Last week	Initial Prod. This week	Initial Prod. Last week
Arkansas	2	3	1	2	..	..	1	1	5	200
California	11	11	11	11	..	..	..	..	7,200	9,070
Illinois	2	3	2	3	..	..	..	..	3	21
Indiana	5	9	3	1	..	2	2	6	92	60
Kansas	35	10	11	6	11	..	13	4	6,000	3,055
Kentucky	35	42	21	25	6	6	8	11	812	1,298
Louisiana	25	22	8	11	8	5	9	6	9,375	5,946
Michigan	5	3	3	3	..	..	2	..	210	1,050
Mississippi	2	4	..	..	1	3	1	1	..	..
New Mexico	3	2	2	2	..	..	1	..	15,500	30,100
New York	..	7	..	7	..	..	..	..	..	15
Ohio	38	35	13	12	14	14	11	9	..	544
Oklahoma	58	72	35	37	7	10	16	25	94,327	99,869
Pennsylvania	31	46	26	42	3	1	2	3	61	160
Texas	158	158	69	85	10	9	76	64	39,038	55,555
West Virginia	20	3	2	2	17	1	1	..	12	60
Total	430	430	207	249	77	51	143	130	172,635	207,003
Increase this week	..	..	..	..	26	..	13	..	..	..
Decrease this week	..	..	42	..	..	..	..	..	34,368	..

Survey for Gas Line to Elwood

Los Angeles.—Surveys are in progress and right of way being secured for a 16-inch natural gas pipe line to hook up the new field of Elwood with the gas lines now serving Ventura Avenue. The distance is 16 miles, and the line is projected by Southern Counties Gas Company.

Los Angeles area is now connected with the Ventura Avenue field with three gas lines, with capacities ample for ordinary gas needs, but last winter during the peak consumption, the lines could hardly meet the demand. It is intended to provide for such emergencies that the new line is to be built.

Long Beach is drawing its gas from the Long Beach field, but this field may not be able to take care of the needs the coming winter, and other communities in the Los Angeles Basin have to be supplied. Last winter the gas companies were barely able to take care of all demands with their supply of natural gas, without resorting to the manufactured article, and since the demand will be greater this winter, a greater supply will be needed.

Fort Worth.—Development of older oil areas in Lea County have been almost terminated by reason of the drilling rush now underway at Hobbs, and wildcat projects have been on the decline. However, two wildcat locations became known within the past week. Galt-Brown Company has authorized the drilling of adeep test on State fee, being 1320 feet south of the north line and on the common line of Sections 8 and 9-15s-35e. The Texas Company and Western Drilling and Engineering Company (Henderson & Dexter) are to proceed at once in carrying out a drilling out a drilling obligation for a test to be located 330 feet north and west of the center of Section 17-17s-34e. The latter is to be known as State 1-D, and is nearly four miles due west of Vacuum Oil Company's small producer at 4900 feet.

Phillips Earnings for First Half

Bartlesville, Oklahoma.—Earnings of the Phillips Petroleum Company for the first half of 1930 after all deductions showed a net of $3,033,552.32, equal to $1.70 a share on the average number of outstand shares. Gross for the period was $14,651,250.90. In commenting on the earnings, Frank Phillips, president of the company, said:

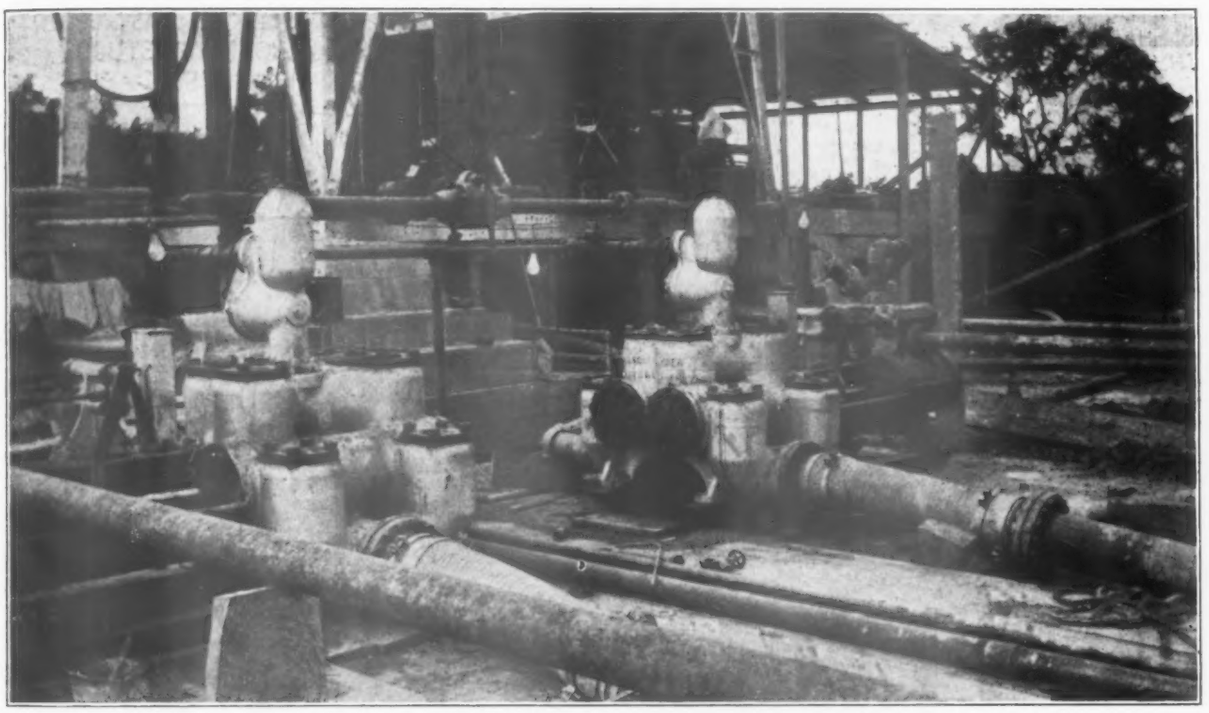
"The increase in earnings this year over last year was due to a greater diversity of activity and to an increasing volume of business in all departments. Production and sales of all commodities handled by your company showed an increase over last year. Your company's products are becoming increasingly popular with the motoring public

Weekly Comparisons of Permits Granted for New Wells

States—	Week Ending July 25	Previous week	This week 1929	Total this month	This month 1929	Total this year	Total this date last year	1929 year total
Arkansas	..	1	..	2	17	60	86	159
California	21	18	16	74	77	471	781	1,231
Louisiana	19	16	16	76	74	628	490	903
Kansas	31	6	31	73	127	627	622	1,079
Oklahoma	45	80	53	277	407	1,980	1,934	3,578
Texas	120	176	179	556	725	4,719	4,972	8,697
Total	236	297	295	1,058	1,427	8,485	8,885	15,647

Lower Drilling COSTS

Direct Flow
Vibrationless
Friction Eliminated



These two Wilson Snyder pumps now being used in the Oklahoma City Field, have proven their superiority, by actual performance.

The exclusive side suction feature permits a connection to be made on the most convenient suction opening. This feature permits a stream line flow of mud from the pit to the pump, eliminating the use of a pipe ell and its attendant sharp turn.

Vibration causes wear on the vital parts of any pump, but construction features of Wilson Snyder pumps are such as to eliminate vibration and the resulting loosening of connections.

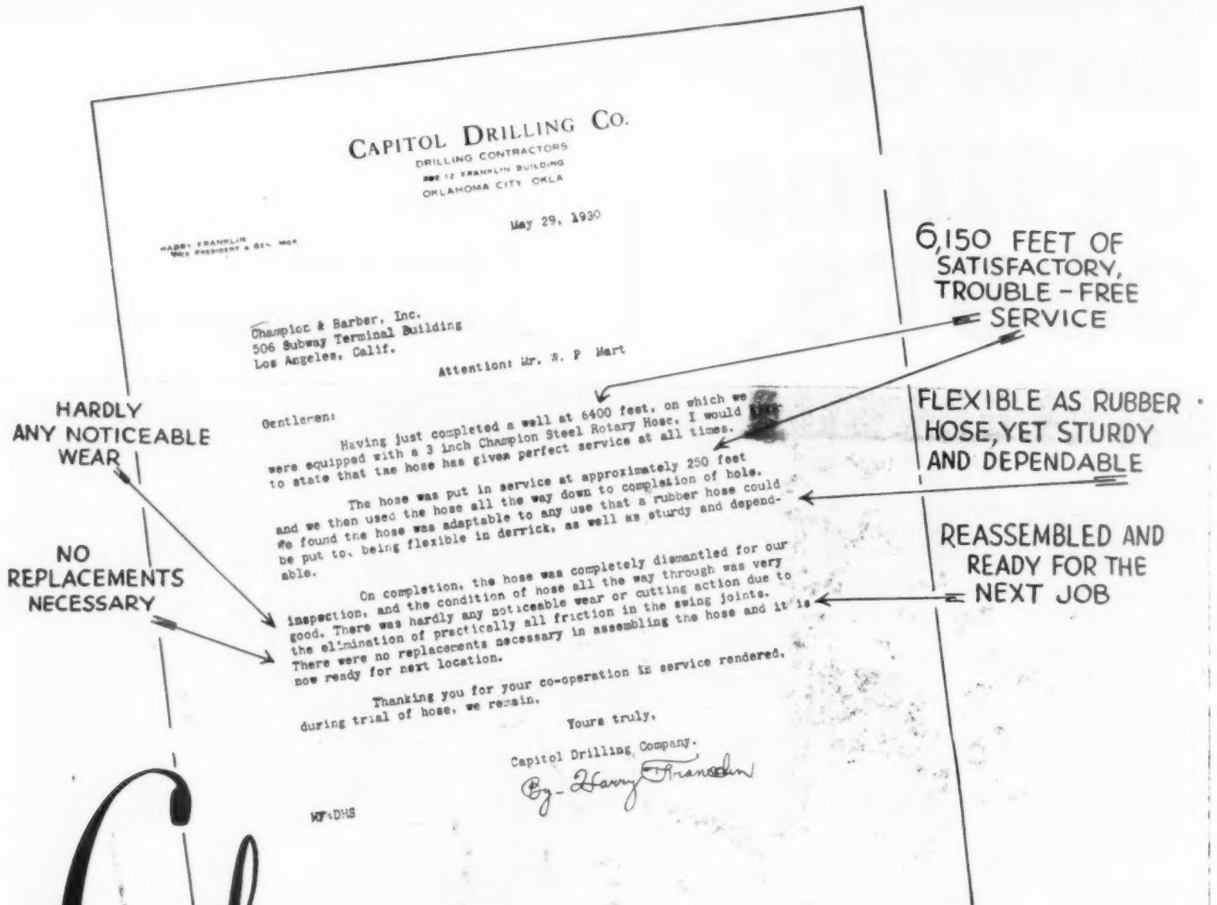
Full volume of mud and the eliminating of unnecessary friction are also gained through these advanced features of construction.

DISTRIBUTED TO THE MID-CONTINENT FIELD BY

MURRAY TOOL & SUPPLY COMPANY
CLEVELAND, OKLAHOMA

OKLAHOMA STORES: Oklahoma City, Phone 3-7736; Pawhuska, Phone 867; Seminole, Phone 119; Tulsa, Phone 4-0144; Yale, Phone 55

Pampa, Texas Phone 894; Wichita Heights, Kansas, Phone 4-3854; Hobbs, New Mexico, Phone 127



CAPITOL DRILLING CO.
DRILLING CONTRACTORS
OKLAHOMA CITY, OKLA.

May 29, 1930

Champion & Barber, Inc.
506 Subway Terminal Building
Los Angeles, Calif.

Attention: Mr. H. P Hart

Gentlemen:

Having just completed a well at 6400 feet, on which we were equipped with a 3 inch Champion Steel Rotary Hose, I would like to state that the hose has given perfect service at all times.

The hose was put in service at approximately 250 feet and we then used the hose all the way down to completion of hole. We found the hose was adaptable to any use that a rubber hose could be put to, being flexible in derrick, as well as sturdy and dependable.

On completion, the hose was completely dismantled for our inspection, and the condition of hose all the way through was very good. There was hardly any noticeable wear or cutting action due to the elimination of practically all friction in the swing joints. There were no replacements necessary in assembling the hose and it is now ready for next location.

Thanking you for your co-operation in service rendered during trial of hose, we remain,

Yours truly,

Capitol Drilling Company.

By Harry Franklin

WF:DHS

6,150 FEET OF SATISFACTORY, TROUBLE-FREE SERVICE
HARDLY ANY NOTICEABLE WEAR
FLEXIBLE AS RUBBER HOSE, YET STURDY AND DEPENDABLE
NO REPLACEMENTS NECESSARY
REASSEMBLED AND READY FOR THE NEXT JOB

Champion
all-steel ROTARY HOSE

A CHAMPION FOR WEAR AND DURABILITY.

If you are a user of rotary hose, this letter carries a lot of meaning for you.

Champion hose was developed to meet the need for a hose that could successfully withstand the high pressures of modern deep well drilling, eliminating shut-downs and heavy expense resulting from repairs and replacements due to hose failures. How well it is succeeding is attested by this letter—one of the many instances where Champion hose is making it possible to drill fast and economically.

Champion hose hangs right, works right, and is right. For more proof and further interesting information, write us now. Your copy of our new catalog is ready.

Champion & Barber
INCORPORATED

506 Subway Terminal Bldg.
LOS ANGELES, CALIF.
Telephone MUtual 2756

Mid-Continent Distributors:
BAILEY & BECKER CO.,
410 Thompson Bldg., Tulsa, Okla.

Export Distributor:
W. S. FELLOWS,
39 Cortlandt St., New York

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1929	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Av.	United States Total
May	679,650	115,400	651,100	150,350	35,350	71,500	114,150	72,850	749,250	2,639,600	81,827,600
June	685,200	120,750	688,200	147,500	35,700	70,050	116,750	72,000	827,200	2,763,400	82,902,250
July	722,050	124,250	718,950	148,150	35,750	68,650	122,000	74,250	874,850	2,888,900	89,555,250
August	728,100	127,950	750,750	153,100	36,300	66,900	126,600	77,900	873,300	2,940,900	91,167,250
September	714,050	128,450	741,200	156,600	37,050	65,300	137,250	78,600	874,850	2,933,350	88,000,650
October	673,600	113,400	714,550	167,050	39,700	64,550	137,400	77,950	876,600	2,864,800	88,809,500
November	640,300	110,050	702,350	171,350	36,750	63,700	135,400	76,550	706,500	2,642,800	79,285,050
December	650,000	111,600	687,850	161,350	38,700	61,850	140,650	76,150	698,200	2,626,350	81,417,000
1930											
January	671,050	111,700	672,650	178,300	37,650	58,500	142,250	73,850	688,850	2,634,800	81,574,650
February	631,900	111,400	654,600	199,950	39,450	58,400	135,050	74,850	746,550	2,652,150	74,280,200
March	622,650	115,500	644,400	206,000	41,600	58,600	132,700	73,600	649,000	2,544,050	78,865,400
April	657,050	122,200	640,950	206,800	42,100	57,800	138,700	75,950	625,700	2,576,250	77,018,100
May	663,300	131,000	662,350	203,900	39,900	53,800	137,150	82,500	623,700	2,597,700	80,529,600
June	665,550	133,600	668,300	210,500	40,300	56,900	135,750	84,600	598,000	2,593,500	77,806,900
July 5	655,900	131,650	657,900	205,950	40,059	55,350	136,950	94,250	603,500	2,581,500	18,070,500
July 12	616,000	128,050	643,550	209,800	39,550	55,600	138,100	87,050	613,100	2,530,800	17,715,600
July 19	586,300	116,300	637,600	209,300	39,400	55,500	138,850	101,950	614,900	2,500,100	17,500,700
July 26	566,850	117,050	643,250	212,350	42,150	45,450	136,350	104,350	610,900	2,488,700	17,420,900
Increase	.....	750	5,650	3,050	2,750	.....	.....	2,400	.....	.....	.....
Decrease	19,450	.....	.....	.....	.....	50	2,500	.....	4,000	11,400	79,800

TEXAS
(Outside Gulf Coast)
PANHANDLE DISTRICT

	July 26	July 19
Carson County	8,900	8,900
Gray County	65,000	70,350
Hutchinson County	21,500	21,200
Wheeler County	600	900
Others	400	400
Total	96,400	101,750

NORTH TEXAS

Archer County	16,250	16,200
Burkburnett	6,300	6,300
Electra	12,500	12,500
Iowa Park-KMA	5,700	5,700
Montague and Cooke Cos.	9,800	9,700
Wilbarger	22,250	22,300
Others	1,750	1,700
Total	74,550	74,450

WEST CENTRAL TEXAS

Brown County	6,400	6,450
Callahan County	3,650	3,700
Coleman County	3,550	3,600
Eastland-Desdemona	5,650	5,700
Jack County	2,200	2,150
Palo Pinto County	550	550
Shackelford County	7,050	7,100
Stephens County	5,550	5,550
Throckmorton County	950	1,000
Young County	18,850	18,900
Others	1,000	1,000
Total	55,400	55,700

WEST TEXAS

Ector	19,050	19,800
Crane-Upton Counties	39,400	40,500
Crockett County	2,150	2,250
Howard County	29,300	29,300
Jones County	1,250	1,300
Mitchell-Scurry Cos.	2,200	2,200
Pecos County	3,850	4,000
Reagan County	21,450	19,000
Winkler County	73,200	69,200
Yates	102,500	102,100
Others	4,300	4,300
Total	298,650	293,950

EAST CENTRAL TEXAS

Boggy Creek	2,900	3,400
Corsicana-Powell	5,800	5,800
Currie	350	350
Mexia	4,500	4,450
Nigger Creek	200	200
Richland	250	250
Wortham	900	900
Van Zandt	26,000	24,000
Total	40,900	39,350

SOUTHWEST TEXAS

Darst Creek	31,500	26,500
Dale	300	300
Laredo District	12,200	11,700
Luling	9,900	9,800
Lytton Springs	850	850
Somerset	1,600	1,650
Salt Flat	20,300	20,900
Others	700	700
Total	77,350	72,400
T'tl Tex. (Outside Gulf Coast)	643,250	637,600

TEXAS GULF COAST

Barbers Hill	20,500	18,850
Batson	1,200	1,200
Big Creek	4,100	4,300
Blue Ridge	1,600	1,650
Boling	1,150	1,100
Damon Mound	700	700
Esperson	2,400	2,500
Fannett	800	750
Goose Creek	4,700	4,700
Hankamar	2,300	2,350
Hull	9,200	8,200
Humble	19,900	18,050
North Dayton	1,350	1,700
Orchard	2,800	2,400
Orange	2,150	2,200
Pettus	5,900	5,050
Pierce Junction	11,150	11,400
Port Neches	1,950	1,850
Refugio	34,300	36,250
Raccoon Bend	12,000	11,850
Saratoga	1,000	1,000
Somerville	1,450	1,500
Sour Lake	2,200	2,200
South Liberty	3,900	3,900
Spindle Top	17,100	18,000
Sugar Land	12,100	12,000
West Columbia	5,600	5,450
Others	2,400	2,400
Total	185,900	183,500
Texas Total	829,150	821,100

OKLAHOMA

Asher	1,050	1,600
Carr City	5,050	7,550
Logan Co.	4,800	4,000
Braman	3,400	3,350
Blackwell	3,200	3,500
Hubbard	1,500	1,500
Thomas	650	650
Tonkawa	8,000	7,200
Garber	4,350	4,400
Burbank	16,000	16,000
Osage (outside Burbank)	25,900	25,750
Cushing	13,450	13,300
Yale Jennings	7,950	7,950
Davenport	1,200	1,200
Bristow Slick	15,450	15,250
North Okmulgee	10,450	10,800
South Okmulgee	7,200	7,300
Cromwell	7,500	7,500
Papoose	2,750	2,700
Wewoka	3,550	3,600
Seminole	18,800	19,050
East Seminole	2,500	2,800
Bowlegs	17,400	20,150
Searight	9,350	9,650
Little River	30,100	30,350
East Little River	10,050	13,750
Earlsboro	26,300	28,400
East Earlsboro	15,700	19,850
S. Earlsboro	9,600	13,000
Duncan District	9,300	9,300
Graham	3,400	3,400
Fox	1,200	1,150
Healdton	12,100	12,100
Hewitt	7,200	7,250
Scholem Alechem	15,100	15,000
Pearson	800	800
St. Louis	26,450	28,700
Allen	16,700	18,200
Maud	4,200	4,700
Mission	9,200	8,650
Oklahoma City	77,450	74,150
Sasakwa	6,100	7,300
Konowa	23,350	23,850
West Asher	4,000	3,000
Others	67,600	66,650
Total	566,850	586,300

CALIFORNIA

Santa Fe Springs	110,500	112,000
Long Beach	101,000	100,000
Huntington Beach	28,000	28,000
Dominguez	10,000	10,000
Inglewood	17,200	17,400
Midway-Sunset	63,000	63,500
Ventura Avenue	48,000	50,500
Seal Beach	21,000	21,300
Elwood-Goleta	45,700	46,500
Kettleman Hills	13,500	13,700
Others	153,000	152,000
Total	610,900	614,900

KANSAS

Greenwood County	19,000	19,550
Florence-Covert	800	750
Peabody-Ebling	2,700	2,050
Eldorado-Towanda	14,000	14,000
Augusta-Fox Bush	2,750	2,800
Rainbow Bend	1,100	1,100
Russell	3,500	3,500
Churchill	3,800	3,900
Oxford	2,750	2,800
Sedgewick	17,950	18,200
Voshell	10,700	8,250
Others	38,000	38,500
Total	117,050	116,300

NORTH LOUISIANA

Homer	3,500	3,500
Haynesville	4,800	4,800
Caddo Light	9,700	9,600
Caddo Heavy	2,900	2,200
DeSoto-Red River	3,100	3,100
Holly	1,250	1,450
Carterville	2,950	2,900
Cotton Valley	2,050	2,050
Urania	5,250	5,250
Zwolle	5,000	2,850
Others	1,650	1,700
Totals North Louisiana	42,150	39,400

LOUISIANA GULF COAST

Bayou Boullion	100	100
East Hackberry	1,750	2,200
Hackberry	1,100	1,100
Edgerly	550	550
Evangeline	2,150	2,400
Lake Barre	1,500	1,600
Lockport	3,100	3,450
Port Barre	4,400	3,650
Sorrento	100	100
Sulphur Dome	4,000	4,450
Sweetlake	100	2,600
Vinton	4,700	4,450
Others	2,900	2,600
Total Louisiana Gulf Coast	26,450	25,800
Louisiana Total	68,600	65,200

ARKANSAS

El Dorado	4,200	4,200
Champagnolle	4,400	4,400
Smackover Light	5,150	5,150
Smackover Heavy	37,550	37,600
Stephens	950	950
Nevada	1,000	1,000
Lisbon	950	950
Others	1,250	1,250
Total	55,450	55,500

MOUNTAIN STATES
Wyoming

Salt Creek	30,000	27,000
Grass Creek	2,050	2,200
Elk Basin	900	850
Big Muddy	2,050	2,050
Lost Soldier	950	950
Rock River	2,100	2,200
Lance Creek	150	150
Oregon Basin	2,850	2,850
La Barge	1,850	2,200
Others	5,200	5,150
Total	48,100	45,700

MONTANA

Cat Creek	1,150	1,150
Sunburst	5,950	5,950
Pondera	2,200	2,300
Others	50	50
Total	9,350	9,450

COLORADO

Moffats (Craig)	1,200	1,150
Fort Collins	1,350	1,300
Florence	550	550
Others	1,600	1,600
Totals	4,700	4,600

NEW MEXICO

Table Mesa	100	100
Artesia	700	700
Hogback	500	450
Rattlesnake	1,400	1,400
Bal. Lea & Eddy Co.'s	39,400	38,500
Others	100	1,050
Totals	42,200	42,200
Totals Mountain States		101,950

EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., N. Y.)	126,500	129,000
Michigan	9,850	9,850
Total Eastern States	136,350	138,850

PRODUCTION SUMMARY

East of Rockies	1,773,450	1,783,250
Total U. S.	2,488,700	2,500,100

Crude Oil Price Quotations

(Revised to July 29, 1930

EASTERN STATES

(Effective July 19, 1930)

*Bradford Grade	2.20
Penn Grade Oil in National Transit Lines (Pennsylvania)	2.05
Penn Grade Oil in Southwest Pennsylvania Lines (Penna.)	2.00
Penn Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	1.75
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.50
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Lines	1.30
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s Lines	1.50
Somerset Oil in Cumberland Pipe Line lines (Kentucky)	1.37
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (Effective Jan. 29, 1929)	.60
Wayne Dist. Oil in Cumberland Pipe Lines	1.24

*Posted by Tidewater Pipe Company.

CENTRAL STATES

(Effective June 26, 1930)

Posted by Ohio Oil Company

Illinois	$1.65
Indiana	1.32
Lima	1.55
Plymouth	1.23
Princeton	1.65
Wooster	1.65

WESTERN KENTUCKY

All grades	1.55

OKLAHOMA-KANSAS

(Effective April 10, 1930)

Below 25 gravity	$ .70
25 to 25.9 gravity	.70
26 to 26.9 gravity	.76
27 to 27.9 gravity	.82
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.10
32 to 32.9 gravity	1.15
33 to 33.9 gravity	1.185
34 to 34.9 gravity	1.22
35 to 35.9 gravity	1.255
36 to 36.9 gravity	1.29
37 to 37.9 gravity	1.325
38 to 38.9 gravity	1.36
39 to 39.9 gravity	1.395
40 to 40.9 gravity	1.43
41 to 41.9 gravity	1.465
42 to 42.9 gravity	1.50
43 to 43.9 gravity	1.535
44 and above	1.57

PANHANDLE

(Effective April 10, 1930)

GRAY COUNTY

Below 29 gravity	.755
29 to 29.9 gravity	.805
30 to 30.9 gravity	.855
31 to 31.9 gravity	.905
32 to 32.9 gravity	.955
33 to 33.9 gravity	1.005
34 to 34.9 gravity	1.055
35 to 35.9 gravity	1.09
36 to 36.9 gravity	1.125
37 to 37.9 gravity	1.16
38 to 38.9 gravity	1.195
39 to 39.9 gravity	1.23
40 to 40.9 gravity	1.265
41 to 41.9 gravity	1.30
42 to 42.9 gravity	1.335
43 to 43.9 gravity	1.37
44 and above	1.405

CARSON-HUTCHINSON COUNTIES

Below 32 gravity	$ .775
32 to 32.9 gravity	.825
33 to 33.9 gravity	.875
34 to 34.9 gravity	.925
35 to 35.9 gravity	.96
36 to 36.9 gravity	.995
37 to 37.9 gravity	1.03
38 to 38.9 gravity	1.065
39 to 39.9 gravity	1.10
40 to 40.9 gravity	1.135
41 to 41.9 gravity	1.17
42 to 42.9 gravity	1.205
43 to 43.9 gravity	1.24
44 and above	1.275

WHEELER COUNTY

Below 30 gravity	$ .755
30 to 30.9 gravity	.805
31 to 31.9 gravity	.855
32 to 32.9 gravity	.905
33 to 33.9 gravity	.955
34 to 34.9 gravity	1.005
35 to 35.9 gravity	.104
36 to 36.9 gravity	1.075
37 to 37.9 gravity	.111
38 to 38.9 gravity	1.145
39 to 39.9 gravity	.118
40 to 40.9 gravity	1.215
41 to 41.9 gravity	.125
42 to 42.9 gravity	1.285
43 to 43.9 gravity	.132
44 and above	1.355

WEST TEXAS

(Effective April 10, 1930)

Crane-Upton, Crockett, Ector, Howard, Pecos and Winkler Counties and Lea County, N. Mex.

Below 25 gravity	$ .65
25 to 25.9 gravity	.68
26 to 26.9 gravity	.71
27 to 27.9 gravity	.74
28 to 28.9 gravity	.77
29 to 29.9 gravity	.80
30 to 30.9 gravity	.83
31 to 31.9 gravity	.86
32 to 32.9 gravity	.89
33 to 33.9 gravity	.92
34 to 34.9 gravity	.95
35 to 35.9 gravity	.98
36 and above	1.01

Magnolia Petroleum Company posts in Crane, Upton and Winkler Counties. Southern Crude Oil Purchasing Company posts only in Crane, Upton and Winkler Counties.

CALIFORNIA CRUDE OIL PRICES AT THE WELL
(EFFECTIVE JUNE 14, 1930)

Following are the current prices offered by Standard Oil Company for crude oil at the wells; (Price per barrel of 42 gallons in fields indicated)

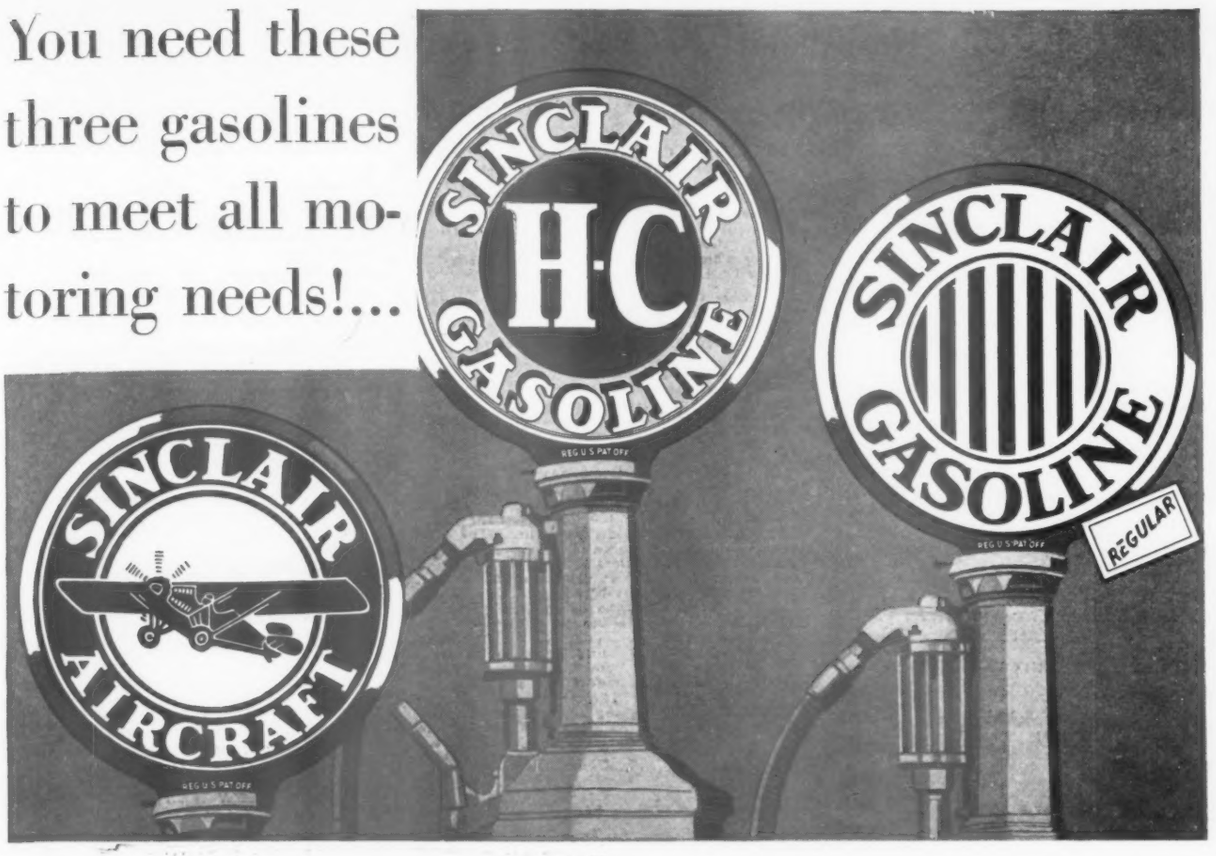
Gravity	Ventura*	Signal Hill	Alamitos Heights Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway-Sunset Elk Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$ .70	$ .70	$ .70	$ .70	$ .70	$ .70	$ ..	$ ..	$ .70	$ .70	$ .70	$ .70	$ .70	..	$ .55	$ .55	$ .55	$ .55	$ .55	$ .55
15-15.9	.70	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.55	.55	.55	.55	.55	.55
16-16.9	.70	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.55	.55	.55	.55	.55	.55
17-17.9	.70	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.55	.55	.55	.55	.55	.55
18-18.9	.75	.76	.76	.76	.76	.76	..	..	.76	.76	.76	.71	.76	..	.55	.62	.62	.62	.62	.62
19-19.9	.80	.82	.82	.82	.82	.82	..	..	.82	.82	.82	.77	.82	..	.55	.70	.70	.70	.70	.70
20-20.9	.85	.88	.88	.88	.88	.88	..	..	.88	.88	.87	.83	.87	..	..	.78	.78	.78	.78	.78
21-21.9	.90	.94	.94	.94	.94	.94	..	..	.94	.94	.93	.90	.93	.92	..	.86	.86	.86	.86	.86
22-22.9	.97	1.00	1.00	1.00	1.00	1.00	..	..	1.00	1.00	.98	.97	.98	.95	..	.94	.94	.94	.94	.94
23-23.9	1.05	1.07	1.07	1.07	1.07	1.07	..	..	1.07	1.07	..	1.05	1.04	1.01	..	1.02	1.02	1.02	1.02	1.02
24-24.9	1.08	1.14	1.14	1.14	1.14	1.14	1.14	..	1.14	1.14	..	1.11	1.10	1.07	..	1.09	1.09	1.09	1.07	1.07
25-25.9	1.13	1.21	1.21	1.21	1.21	1.21	1.19	..	1.21	1.21	..	1.17	1.16	1.13	..	1.16	1.16	1.16	1.12	1.12
26-26.9	1.18	1.28	1.28	1.28	1.28	1.28	1.24	..	1.28	1.28	..	1.23	1.23	1.19	..	1.23	1.23	1.23	1.17	1.17
27-27.9	1.23	1.35	1.35	1.35	1.35	1.35	1.29	..	1.35	1.35	..	1.29	1.30	1.25	..	1.30	1.30	1.30	1.23	1.22
28-28.9	1.28	1.42	1.42	1.42	1.42	1.42	1.34	..	1.42	1.42	..	1.35	1.37	1.31	..	1.35	1.35	1.35	1.27	..
29-29.9	1.33	1.46	1.46	1.46	..	1.46	1.39	..	..	1.46	..	1.38	1.41	1.37	..	1.41	1.41	1.41	1.31	..
30-30.9	1.39	1.50	1.50	1.50	..	1.50	1.45	..	..	1.50	..	1.41	1.45	1.43	..	1.47	1.47	1.47	1.35	..
31-31.9	1.45	1.55	1.55	1.55	..	1.55	1.51	..	..	..	..	..	..	1.49	..	1.53	1.53	1.53	1.39	..
32-32.9	1.51	1.60	1.60	1.60	..	..	1.57	..	..	..	..	..	..	1.55	..	1.59	1.59	1.59	1.43	..
33-33.9	1.58	..	..	..	..	..	1.64	..	..	..	..	..	..	1.60	..	1.65	1.65	1.65	1.47	..
34-34.9	..	..	..	..	..	..	1.71	1.32	..	..	..	..	..	1.65	..	..	..	1.71	1.51	..
35-35.9	..	..	..	..	..	..	1.78	1.39	..	..	..	..	..	1.70	..	..	..	1.77	1.55	..
36-36.9	..	..	..	..	..	..	1.84	1.46	..	..	..	..	..	1.75	..	..	..	..	..	..
37-37.9	..	..	..	..	..	..	1.90	1.53	..	..	..	..	..	1.80	..	..	..	..	..	..
38-38.9	..	..	..	..	..	..	1.96	1.60	..	..	..	..	..	1.85	..	..	..	..	..	..
39-39.9	..	..	..	..	..	..	2.02	1.66	..	..	..	..	..	1.90	..	..	..	..	..	..
40-40.9	..	..	..	..	..	..	2.08	1.72	..											
41-41.9	..	..	..	..	..	..	2.14	1.78	..											
42-42.9	..	..	..	..	..	..	2.20	1.84	..											

KETTLEMAN HILLS—55 degrees Gravity and above $1.65 per barrel. *Union Oil Company.

General Petroleum Posts following prices 11-13.9 Gr. 50c, 14-22.9 55c at Kern Front, Fruitvale, Mt. Poso Creek and Rd. Mountain districts.

(See page 208)

You need these three gasolines to meet all motoring needs!...



Sell SINCLAIR THREE-GAS SERVICE!

The easiest way to increase your gallonage is to offer every motorist the opportunity to select the RIGHT gasoline for his own engine and his own driving habits.

Let him choose from THREE DIFFERENT KINDS, through Sinclair Three-Gas Service.

If he wants his engine to get away like a rocket, to be flashy in traffic and brilliant on the road, then recommend Sinclair Aircraft Gasoline . . . the *Ace* of high test gasolines. Sinclair Aircraft is the Ace of high test gasolines because it is specially manufactured at Sinclair Refineries, meeting the requirements of the Federal Specifications Board for Aviation Gasoline — domestic grade — and gives sustained power. Due to its careful fractionation it is free from dissolved gases which cause gas locks, uneven distribution, galloping and engine balk.

Or, if he wants the remarkable high compression gasoline that stops knocks in his engine and takes the hills in high . . . then his gas is H-C. It's all gasoline, nothing added.

Or, if he prefers to pay three cents less per gallon — here's Sinclair Regular Gasoline — full of eager power — full of economy and mileage. The quality gasoline at a popular price!

Try selling Sinclair Three-Gas Service — you'll sell more satisfaction and get more volume.

SINCLAIR REFINING COMPANY, INC., 45 Nassau Street, New York — *Atlanta, Chicago, Houston, Kansas City*

CRUDE OIL PRICE QUOTATIONS (*Continued from Page 206*)

HOWARD AND GLASSCOCK COUNTY CRUDE

(Effective April 10, 1930)

Below 25 gravity	$ .65
25 to 25.9 gravity	.68
26 to 26.9 gravity	.71
27 to 27.9 gravity	.74
28 to 28.9 gravity	.76
29 to 29.9 gravity	.78
30 to 30.9 gravity	.80
31 to 31.9 gravity	.82
32 to 32.9 gravity	.84
33 to 33.9 gravity	.86
34 to 34.9 gravity	.88
35 to 35.9 gravity	.90
36 and above	.92

MARKHAM

The Texas Company

(Effective April 11, 1930)

All grades	$ .85

CORSICANA HEAVY

All grades	$ .80

SALT FLAT AND DARST CREEK

All grades	$1.15

SOUTH TEXAS

Mirando	$ .85
Luling	.85

NORTH AND CENTRAL TEXAS

(Effective April 10, 1930)

Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude

Below 25 gravity	$ .72
25 to 25.9 gravity	.77
26 to 26.9 gravity	.82
27 to 27.9 gravity	.87
28 to 28.9 gravity	.92
29 to 29.9 gravity	.97
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.07
32 to 32.9 gravity	1.12
33 to 33.9 gravity	1.17
34 to 34.9 gravity	1.22
35 to 35.9 gravity	1.255
36 to 36.9 gravity	1.29
37 to 37.9 gravity	1.325
38 to 38.9 gravity	1.36
39 to 39.9 gravity	1.395
40 to 40.9 gravity	1.43
41 to 41.9 gravity	1.465
42 to 42.9 gravity	1.50
43 to 43.9 gravity	1.535
44 and above	1.57

GULF COAST

(Effective April 10, 1930)

Grade "A" all companies	$1.15

Grade "B"

Below 25 gravity	$1.00
25 to 25.9 gravity	1.03
26 to 26.9 gravity	1.06
27 to 27.9 gravity	1.09
28 to 28.9 gravity	1.12
29 to 29.9 gravity	1.15
30 to 30.9 gravity	1.18
31 to 31.9 gravity	1.21
32 to 32.9 gravity	1.24
33 to 33.9 gravity	1.27
34 to 34.9 gravity	1.30
35 to 35.9 gravity	1.33
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.39
38 to 38.9 gravity	1.42
39 to 39.9 gravity	1.44
40 to 40.9 gravity	1.46
41 to 41.9 gravity	1.48
42 to 42.9 gravity	1.50
43 to 43.9 gravity	1.52
44 and above	1.54

CLASSIFICATIONS OF GULF COAST CRUDE

The Texas Company: GRADE A—Beaume gravity not over 26.0 degrees at 60 degrees Fahrenheit; sulphur not over 0.5 per cent; in distilling 500 cc. of the crude that part of the distillate cut between 65 per cent off and 85 per cent off shall have a pour test of zero or lower. GRADE B—All Gulf Coast heavy crudes which do not meet tests for Grade "A" or for Gulf Coast light.

Humble Oil & Refining Company: GRADE A—All crude conforming to the following tests: viscosity not less than 100 seconds Saybolt at 100 degrees Fahrenheit; sulphur not over .4 per cent; Beaume gravity not over 25 at 60 degrees Fahrenheit. Cold tests of distillates having a viscosity of 1000 seconds at 100 degrees Fahrenheit shall not be over 5 degrees Fahrenheit. GRADE B—Embraces all Coastal crude which does not meet the tests for "A" grade crude.

Gulf Pipe Line Company: GRADE A—Beaume gravity not over 24 at 60 degrees Fahrenheit; viscosity not less than 100 seconds universal Saybolt at 100 degrees Fahrenheit; and sulphur not over 0.4 per cent. The yield of 250 viscosity reduced distillate at 100 degrees Fahrenheit not less than 30 per cent, and this 30 per cent not heavier than 20 Beaume, and its pour test not above zero Fahrenheit. The reduced distillate to be secured by reducing the crude with fire and steam until the bottoms have a flash of not less than 540 degrees Fahrenheit, and not more than 560 degrees Fahrenheit open cup, and the entire distillate obtained in this way reduced to a distillate of 250 viscosity. The 10 per cent cut in the original distillate having an average viscosity of 500 seconds at 100 degrees Fahrenheit to have a pour test not higher than 5 degrees Fahrenheit. GRADE B—Embraces crude which does not meet test for "A" grade.

Sun Pipe Line Company: GRADE A—Viscosity not less than 100 seconds at 100 degrees Fahrenheit Saybolt. Sulphur not over .4 per cent. Beaume gravity not over 25 at 60 degrees Fahrenheit. Cold Test: of distillates having viscosity of 1000 seconds at 100 degrees Fahrenheit shall not be over 5 degrees Fahrenheit A. S. T. M. Method. GRADE B—All Coastal crudes which do not meet specifications for Grade A crude.

REFUGIO

(Effective April 10. 1930)

Below 25 gravity (Heavy)	.85

REFUGIO (Light)

Same as Gulf Coast 25 gravity and above.

PETTUS

(Effective April 10. 1930)

All grades	$1.40

BRENHAM

(Effective March 1, 1930)

All grades	.95

STATE CRUDE PRODUCTION TAXES

Oklahoma—Three per cent of gross value, less royalty interest.

Texas—Two per cent of gross value.

Louisiana—From four to 11 cents a barrel, depending upon gravity.

Arkansas—2.6 per cent of gross market value.

Montana—Two per cent of gross value at well.

Wyoming and New Mexico—production tax based upon state and county assessments.

California—.66443 mills per barrel of oil produced and 17.39 cents per acre on proved oil lands.

WYOMING-MONTANA

(Effective April 11, 1930)

Wyoming

Byron	$1.3..
Ferris	1.60
Elk Basin	1.5..
Grass Creek	1.5..
Rock Creek	1.3..
Lost Soldier	1.05
Lance Creek	1.63
Mule Creek	1.20
Notches	.65
Big Muddy	1.38
Osage	1.65
Hamilton Dome	.85
Filot Butte	1.75
Torchlight-Greybull	1.65
Lander	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

SALT CREEK

Midwest Refining Company

29 to 29.9 gravity	$ .90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 and above	1.23

MONTANA

(Effective Feb. 15, 1930)

Sunburst	$1.65
Cat Creek	1.48
Lake Basin	2.20

NEW MEXICO

(Effective April 11, 1930)

Artesia	1.05
Hog Back	1.43
Maljamar	.95
Jal and Lea	*

(*) West Texas price scale used by The Texas Company and Humble Oil & Refining Co.

CANADA

(Effective June 28, 1930)

Oil Springs	1.95
Petrolia	2.02

LOUISIANA-ARKANSAS

(Effective April 11, 1930)

Homer, Haynesville, Caddo, El Dorado, De-Soto and Crichton and Cotton Valley*

Below 28 gravity	$ .87
28 to 28.9 gravity	.92
29 to 29.9 gravity	.97
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.07
32 to 32.9 gravity	1.12
33 to 33.9 gravity	1.17
34 to 34.9 gravity	1.22
35 to 35.9 gravity	1.255
36 to 36.9 gravity	1.29
37 to 37.9 gravity	1.325
38 to 38.9 gravity	1.36
39 to 39.9 gravity	1.395
40 to 40.9 gravity	1.43
41 to 41.9 gravity	1.465
42 to 42.9 gravity	1.50
43 to 43.9 gravity	1.535
44 gravity and above	1.57

*Shreveport-Eldorado's postings stop at above 40 gravity.

The posting on Cotton Valley is same as Caddo. From 36 to 52 and above the regular gravity schedule is followed.

The Texas Company pays North Texas gravity scale in North Louisiana.

STEPHENS

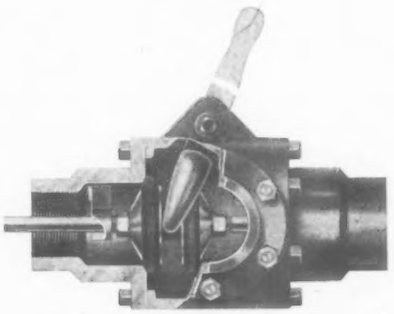
Below 28 gravity	$ .76
28 to 28.9 gravity	.81
29 to 29.9 gravity	.86
30 to 30.9 gravity	.91
31 to 31.9 gravity	.96
32 gravity and above	1.01

SMACKOVER

Below 24 gravity	$ .90
24 and above	1.05

Still other successes by Brauer

Stand Pipe Valve



Manufactured under Gill patent appl.

This valve is made to take the place of the commonly used gate valves in your stand pipes.

Its rugged construction insures economy as it has proven that it will last several times as long as the regular gate valves.

You will have no time lost in changing and repairing valves.

It is operated by a hand lever and takes but a second or two to switch from one stand pipe to the other.

It is automatically drained, thereby eliminating any danger of freezing.

Compounding Type Manifold Valve

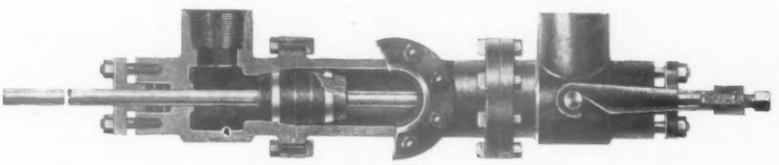
The compounding type manifold valve is made especially for fields where it is necessary to compound your pumps.

The plunger can be locked on either side by means of a set screw yoke which will permit the use of both pumps at the same time.

This valve is used in the manifold between your slush pumps and is for the purpose of automatically closing the discharge line of the pump not in use and diverting the flow of fluid up to the stand pipe.

By closing the steam valve on the pump that you have been using and opening the steam valve on the other, the fluid pressure automatically forces the double tapered plunger valve into the opposite seat and diverts the flow up through the stand pipe. These can be connected up in several different ways and we will be glad to furnish sketches showing them.

Positive in its operation.
Will not sand up under any condition.
Withstands any operating pressure.
Made of high grade cast steel.
Tongue and groove flanges.
Extra plunger valve shipped with each valve.
Packing dovetailed in place.



Manufactured under Beebe patent

OTHER BRAUER PRODUCTS

Swivel Circulating Head
Hydraulic Wall Hook
Shale Separator
Stand Pipe Goosenecks
Compound Brake Lever
Valve Seat Pullers
Elastic Safety Lock Nuts
Special High Pressure Fittings

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BRAUER MACHINE & SUPPLY CO.
Oklahoma City, Okla.

Personal Mention--Men You Know

Norval White, manager of the West Coast office of the American Petroleum Institute, headquarters at San Francisco, was in Los Angeles July 22 and 23 to attend the meeting of the American Petroleum Institute committee on disposal of production waste.

Chas. C. Hoffman, chief geologist for Empire Gas & Fuel Company in the Fort Worth division, has been transferred to Bartlesville, Oklahoma, and appointed chief geologist for the Cities Service Gas Company, which is aggressively developing additional natural gas reserves for its affiliated gas lines. Hoffman is taking a vacation before reporting at Bartlesville on August 1.

Elmer Schmidt, construction engineer for Lone Star Gas Company, Dallas, visited Chicago during the past week in connection with natural gas trunk line being constructed from Panhandle district to Middle Western cities by Lone Star Gas Corporation and associated companies.

S. P. Tschappat, general manager of the Hercules Tool Company of Tulsa, has returned from an extensive field trip by airplane that included the Hobbs area in New Mexico.

V. Weaver Smith of the Superheater Company of New York is on a tour of the oil fields including a visit to the Oklahoma City area in company with L. L. Barnes, service engineer of the company who is located there. Mr. Smith also will visit the Texas and California fields before returning to New York.

O. W. Bryant, Anglo-Persian Oil Co., London, who has been visiting old friends and relatives in Texas and California for the last two months, will sail from New York on July 30 enroute to Masjid-I-Sulamain, South Persia where he has been stationed for the past six years. Mr. Bryant will stop in London for several weeks to be married. His bride will accompany him to Persia.

Ford Braddish, consulting geologist and associate of J. P. Johnston, independent operator, with headquarters at Fort Worth, departed last week for a vacation trip to his former home in Michigan.

J. M. Charlton, representative of the land and lease department of The California Company, has returned to headquarters at Dallas after spending the past month in Southwest Texas, where the company has acquired a few blocks of wildcat leases.

MOSCOW, U. S. S. R.—By mail, July 11.—Information received in my travel in Russia to date, including talks with government officials and those connected with the petroleum industry in the United States of the Soviet Republics indicate that the five year program for the oil industry in Russia will be completed considerably in advance of the period of time set.

It now would appear, from information given me, that the five year program will be completed within three years.

—R. E. LEIGH.

G. Prikel, a field superintendent for a Shell subsidiary in Roumania, and H. W. O. Bruijn, petroleum engineer, connected with a Shell subsidiary in Sumatra, are spending most of July in California studying oil field operations. They spent July 21 and 22 inspecting the Baash Ross Tool Company shops in Los Angeles, and visiting the nearby fields with H. H. Clark, sales manager for Baash Ross.

G. L. Armstrong, pumper on the Bardsdale-Grimes lease in Ventura County for Union Oil Company of California, was recently awarded a service emblem, indicating 30 years continuous service with that company. Only three others in the company have been awarded similar emblems, being former President W. L. Stewart, who died June 21; Vice-President W. W. Orcutt, and rank Hill, manager of field operations. Eight employes were also awarded 20-year emblems.

W. G. Burton, 59, Fort Worth oil operator, died in Oklahoma City following a heart attack on July 24. The remains were forwarded to Fort Worth for burial July 27.

Fred Devenney has been appointted district representative of James B. Sipe & Company, Pittsburgh paint manufacturer, for the Tulsa territory. He will have headquarters at 8 North Cheyenne street.

D. C. Williams has been elected president of Ponca City Gas Distributing Company, to succeed Harry Moreland, who has been chosen vice-president and general manager of Great Lakes Pipe Line Company. The Ponca City Gas Distributing Company is a subsidiary of Continental Oil Company, which with Barnsdall Oil Corporation has formed the Great Lakes Pipe Line Company to transport gasoline from Oklahoma to cities on the Great Lakes.

C. H. Wright of Tulsa has been elected president of Sunray Oil Corporation of Delaware. His election followed the promotion of Crosby Gaige to chairman of the board. R. S. McFarland of Tulsa was elected vice-president; I. E. Rines of New York, vice-president and secretary; W. D. Forster, Tulsa, assistant secretary and treasurer, and E. A. Peterson assistant secretary and assistant treasurer. The board of directors of the company consists of A. E. Bridger, New York; J. G. Cloud, Tulsa; J. F. Collins, New York; Herbert Coope, Long Island City; W. N. Croxton, New York; J. E. Dickson, Oklahoma City; M. M. Doan, Tulsa; Hamilton Fish, Jr., New York; Crosby Gaige, New York; W. E. Hightower, Oklahoma City; J. M. Lovejoy, New York; R. S. McFarland, Tulsa; C. I. McLaughlin, New York; I. E. Rines, New York; H. M. Teets, New York; C. L. Wardell, New York; R. H. Weatherly, New York, and C. H. Wright, Tulsa. Sunray Oil Corporation is a holding company for Sunray Oil Company, Minnehoma Oil Company and other subsidiaries. C. H. Wright was chosen president of Sunray Oil Company; R. S. McFarland, vice-president and general manager; R. P. Able, vice-president in charge of production, and W. D. Forster, secretary and treasurer.

Levi Smith, president of Big Lake Oil Company, with headquarters at Texon, Texas, is visiting the general offices of Plymouth Oil Company at Pittsburgh. The latter company controls Big Lake Oil Company.

F. E. Bernsen, vice-president of Lucey Products Corporation, accompanied by Mrs. Bernsen, is motoring to California on a combined business and pleasure trip. He will be on the Coast until the latter part of August.

Donald C. Barton was the speaker at the weekly luncheon of the Houston Geological Society held last Tuesday in the dining room of the Lamar hotel. The subject of his talk was: "A New Thought on the Mechanics of Salt Domes."

Benjamin F. Harris, president of Oil Well Supply Company, confirmed to a representative of the Oil Weekly, the report that Oil Well Supply Company has given United States Steel Corporation an option to purchase the business, the option to expire August 25. Should the option be exercised and the purchase consumated, it is understood that Oil Well Supply Company will retain its corporate identity.

Oklahoma--Kansas Field Notes

FLOYD L. SWINDELL, *Staff Representative, Tulsa, Oklahoma*

Oklahoma City Wells Flow One Day in Twelve Under Plan

OKLAHOMA CITY.—Twelve wells were completed in the Oklahoma City pool during the week. Phillips Petroleum Company's Traders Compress 1, SWc, Section 36-12n-3w, located in an area where wells have been coming in for 15,000 to 20,000 barrels initially, produced only 4055 barrels for its initial gauge. This test had the top of the Detrital at 6075 feet after having set 6⅝-inch casing at 6067 feet. It was drilled to 6393 feet. Hourly gauges were as follows: First hour, 131 barrels; second hour, 112 barrels; third hour, 204 barrels, and fourth hour, 196 barrels, with 86,000,000 cubic feet of gas under 105 pounds back pressure.

Present indications are that the northwest limit of production will soon be defined, although it is probable that a large percentage of the wells now drilling will be producers. One location northwest of the Traders Compress 1, Franklin Petroleum Corporation's Minnie Page 1, had water in the top of the Arbuckle limestone and is being plugged back.

The largest completion in the north end was Slick and Atkinson's Baker 4, NW NE SW NW, Section 1-11n-3w, which produced 14,681 barrels in 19 hours 35 minutes along with 41,000,000 feet of gas. Top of Detrital was at 6138 feet, broken sand 6138 to 6210 feet, and top of the second sand at 6385 feet. Total depth is 6493 feet.

In the southern part of the field, Indian Territory Illuminating Oil Company, completed Jones 13, SW SW NW, Section 31-11n-2w, for an initial flow of 6866 barrels in four hours and 35 minutes. Oswego lime was topped at 6280 feet, broken sand at 6470 feet with the 6⅝-inch casing set at 6441 feet. Total depth is 6607 feet.

At seven o'clock on the morning of July 28, the shutdown order which has been in effect during the past 24 days, came to an end when operators agreed to open wells on an 8 1/3 per cent time basis. This permits production from each well for one day during each 12-day circle. So far as can be learned at this time the shutdown did not accomplish its purpose principally because a large number of wells were considerably under-produced when the order became effective and because the pipe lines were unable to take but little over the daily production from under-produced wells and new completions taking their initial gauges. At the beginning of the shutdown agreement pipe line companies agreed to take 85,500 barrels daily, but the actual taking has been less. Approximately 1,000,000 barrels are now in storage and, without further restriction on production, the storage situation will continue to be a problem for some time.

Committee Plans Exhibits for Tulsa Exposition in Fall

TULSA.—W. A. Schlueter, president of Refinery Supply Company of Tulsa, has been appointed chairman of the technical committee of the International Petroleum Exposition and Congress. He will name sub-chairman for the different divisions of the petroleum industry. Production, refining, natural gas and natural gasoline each will be represented by a sub-chairman, who will select his own division of the technical committee.

One of the duties of the technical committee is that of selecting the exhibits, which will be seen in the technical committee. Each year some of the outstanding developments of the industry are brought to the exposition in this division.

This year there will be a demonstration of glass blowing. Corning Glass Works of Corning, New York, has agreed to send expert glass blowers who will demonstrated how the glass products used in the petroleum industry are made.

Directors of the exposition met July 25 and took action in regard to the part the veteran individuals of the industry will play in the coming exposition. It has been the policy to extend special favors to these men for several years. Each year "The Grand Oil Man of the Industry" is selected. Details for the seventh exposition have not been worked out.

Information reached Tulsa last week to the effect that Alfred Wirth, the outstanding equipment manufacturer of Europe, will be in Tulsa for the exposition. His wife will accompany him. His company will have a display of its equipment.

Discovery of Another Central Kansas Oil Pool Is Imminent

WICHITA.—Although no final test has been made, indications point to the uncovering of another central Kansas oil pool in Rice County, where Tatlock and Elwell have drilled Pflogg 1, C SW SE, 33-18-9w into an oil bearing formation at 3270 feet. The well is 15 miles northeast of the Schurr pool in the same county.

This well was drilled on a block of 10,240 acres, owned by Shell Petroleum Corporation, Empire Oil & Refining Company, Carter Oil Company, J. A. Hull Company and the drillers of the well. The well bailed at the rate of 125 barrels daily. Before further tests can be made tankage will have to be provided and 100 feet of open hole cased.

This well is one of the many tests which have been spotted from the center of the state westward in the past 18 months. The producing formation has not been identified.

Cowley County in the southern part of the state has another promising wildcat well, Sloan 1, SW NW NW, 28-30-3e, drilled by the Blankenship Petroleum Company. The well began showing oil at 2973 feet and was drilled but two feet deeper. Seven bailers of oil were taken out in two hours. The hole has been left for running smaller pipe.

A perplexing spot, as yet small in area and in output, is the Eastborough field in the eastern edge of the City of Wichita. Since Vickers Petroleum Company found Wilcox sand production in its Keys 1, additional drilling has followed.

Nearness of the Eastborough field to refineries at Wichita has given the few producing wells outlet as short pipe lines are being provided. This has proved a barrier to efforts to curtail well output. While the output is now of little consequence it stands a chance of becoming substantial and of having outlet, which will not come under any general proration agreement.

The Grattan 2, SW SW NW, 34-20-3w, drilled by T. B. Slick et al, has been accepted as a half-mile extension of the Voshell pool of McPherson County. It filled with oil from both the Villa lime and the Wilcox sand, 3447-50 feet. The well is north of the field.

Drilling activities for all of Kansas is yielding in response to curtailment of pipe line runs. The Schurr field in particular is being closed down on this account. Without any crude oil outlet, drilling wells are either being shut down at present levels or will be shut down at the top of the producing formation. The field has five wells but pipe line concerns have declined to extend facilities to the pool.

Gauge Through Tubing Reduces Hobbs Potential

HOBBS, New Mexico.—Potential production estimates on all the large oil producers in the Hobbs field are declining an average of about 50 per cent as a result of proration tests being taken through three-inch tubing for the second proration period that begins August 1. Tubing gauges taken late last week by Umpire C. G. Staley on nine of the big wells that were included in mid-July open flow potential figures registered a decline from 100,979 to 50,857 barrels daily. Figures are not available on the balance of the completions as all wells had not been regauged early this week; but it is certain that the field will fall short of equalling its former potential of 146,501 barrels, although two big producers have been added in the meantime.

Hobbs field proration advisory committee adopted the plan of gauging wells for proration purposes only through tubing at a meeting held in Roswell, July 18. The committee acted in good faith, with strict conservation measures as the motive for retaining back pressure on the wells at all times, but did not anticipate the penalties placed on the many wells in the field that are unable to truly demonstrate their potentialities when restricted to three-inch tubing. Protests have been formally placed before this committee by a number of large well owners, and indications are that future gauges for proration purposes will be with wells flowing through casing and tubing. The rock pressure in the flush section of the field is about equal in all wells, and when the oil flow is confined to tubing the heavy producers virtually have a maximum production figure allotted them, while medium sized wells stand chance to boost their potentials.

Based on preliminary figures available on the new gauges, wells are not apt to exceed 7500 barrels daily potential when tested through tubing; Tidal Oil Company's Grimes 1, which earned a potential of 24,696 barrels daily on the initial proration schedule when flowed open, only made 7150 barrels potential when gauged last week through tubing, or a decline of more than two-thirds. Shell Petroleum Corporation's McKinley 1 averaged about 11,000 barrels daily for a number of days prior to proration enforcement, and was given a potential of 11,270 barrels on the first proration schedule, but dropped to 6139 barrels potential late last week when tested through tubing. Amerada Petroleum Corporation's two producers on the McKinley farm dropped about 50 per cent in potential also, with the decline about evenly distributed between both wells. McKinley 1 made 5220 barrels potential through tubing as compared to 9402 barrels on open flow, and McKinley 2 dropped from 10,608 to 6348 barrels. Geo. F. Getty Oil Company's McKinley 1 dropped from 10,992 to 5856 barrels on potential. Texas Pacific Coal & Oil Company's State 1-G was cut from 9048 to 5232 barrels.

Potential gauges are taken in the presence of the umpire, and wells are gauged for three hours, but only the last two hours are used as a basis for arriving at the 24-hour production estimates. Allowable production for the field is expected to remain at 35,000 barrels daily during the next period.

Drilling activity in the Hobbs field continues to reach out in all directions from the north portion, or flush section of the field. During the past week Gypsy Oil Company began digging cellar for a test to be drilled in the SEc NE Section 24-18s-37e, thus creating offsets for Texas Pacific Coal & Oil Company, Shell Petroleum Corporation and Empire Gas & Fuel Company. The latter three are proceeding with development even though the outpost location is a half mile north of nearest production. Humble Oil & Refining Company and Kirby Petroleum Company advised adjoining lease owners that development would commence at once in the SWc NE NE Section 29-18s-38e, explaining that such was an obligation.

HOBBS FIELD, NEW MEXICO, OPERATIONS

Operator—	Drilling Tests	Derricks and Rigs	Locations	T'tl
Amerada Petroleum Corporation	5	.	1	6
Atlantic Oil Producing Company	1	.	.	1
The California Company	2	.	3	5
Continental Oil Company	4	1	.	5
Empire Gas & Fuel Company	.	2	1	3
Geo. F. Getty Oil Company	2	.	1	3
Gypsy Oil Company	4	1	.	5
Hobbs-High, Inc.	1	.	.	1
Humble Oil & Refining Company	8	1	.	9
Humble-Kirby Petroleum Company	.	1	.	1
Landreth Production Corporation et al.	2	1	.	3
Midwest Refining Company	8	2	.	10
Ohio Oil Company	.	1	.	1
Ohio-Independent Oil & Gas Company	3	.	.	3
Prairie Oil & Gas Company	.	1	.	1
Shell Petroleum Corporation	5	7	1	13
Skelly Oil Company	1	.	.	1
Sun Oil Company	1	.	.	1
The Texas Company	3	.	.	3
Tidal Oil Company	2	.	2	4
Texas Pacific Coal & Oil Company	.	1	.	1
Total	52	19	9	80
Total previous week	44	16	10	70

Rigs Number 52

Survey of field operations early this week credit Hobbs with having 52 rotary and cable tool rigs at work; 19 other tests erecting derricks, or installing rigs; and nine locations, making a total of 80, as compared to 70 one week previous. The field has 28 completed oil wells, and should add a half dozen more by mid-August.

Operators are clinging reasonably close to the proven oil area at Hobbs, with only two tests underway more than a mile from production. Landreth Production Corporation et al's State 1-A, located two miles north of the field, is nearing a decisive depth, having reached the 4200-foot level early this week without encountering the usual upper gas production. Hobbs-High, Inc.'s Tatum 1, located east of Hobbs townsite, is drilling below 3400 feet after encountering 500 feet of salt water at 3360 feet. This water has no particular significance.

Development of older oil areas in Lea County have been almost terminated by reason of the drilling rush now underway at Hobbs, and wildcat projects have been on the decline. However, two wildcat locations became known within the past week. Galt-Brown Company has authorized the drilling of a deep test on State fee, being 1320 feet south of the north line and on the common line of Sections 8 and 9-15s-35e. The Texas Company and Western Drilling and Engineering Company (Henderson & Dexter) are to proceed at once in carrying out a drilling obligation for a test to be located 330 feet north and west of the center of Section 17-17s-34e.

North and West Texas Field Notes

H. H. KING, *Staff Representative, Fort Worth, Texas*

Panhandle Crude Buyers Reduce Purchases 7,000 Barrels

PAMPA, Texas.—Two of the largest crude purchasing companies in the Texas Panhandle made known their intentions of immediately reducing their takings about 7000 barrels daily since operators have failed after numerous efforts to work out a voluntary proration plan. A conference of operators was held here on the morning of July 28, with H. M. Stalcup, vice-president in charge of production for Skelly Oil Company, Tulsa, presiding as chairman.

Representatives of Prairie Oil & Gas Company informed the operators that crude takings by the company from the district would be cut from 18,000 to 14,000 barrels daily, while those of Humble Oil & Refininig Company are to be reduced from an average of 12,000 to 9000 barrels daily. These two major purchasers are important crude market outlets for independents in Gray, Carson and Hutchinson Counties, and are obtaining the bulk of their oil supply from leases in Gray County.

Production in the district averaged 95,420 barrels daily during the past week, with Gray County leading the group of counties with an average of 64,950 barrels daily during this period. A large percentage of this high yield in Gray County is coming from semi-flush leases in the Finley-Brown field, where big wells have been scored frequently. Major companies have been actively engaged in drilling up their prolific leases in the Finley-Brown field during the past year, and have provided their own market outlet, while the comparatively few independents possessing leases in the area have had a tussle for market relief. This condition led to the purchase of a local refinery by H. F. Wilcox Oil & Gas Company and erection of a refinery at Pampa by Danciger Oil & Refining Company.

Stalcup appointed a committee of nine to be composed of major and independent producers, pipe line and crude buying companies. This committee has been requested to gather detailed information in regard to current crude production of each operator by counties, and also determine the crude demand of purchasing agencies, as well as transportation facilities now available. Such information will be submitted at the state-wide proration and conservation meeting to be held at Austin, July 30, by the Texas Railroad Commission.

Moore County renewed its bid for a prominent position in Panhandle oil circles late last week when Shamrock Oil & Gas Company's J. H. Shory 1, located about two miles southeast of the nearest production in the Morton pool and in the northern part of the county, sprayed about 100 barrels oil daily from sandy-lime at 3498-3505 feet. This semi-wildcat is making about 6,000,000 cubic feet of gas at 3350-3505 feet, with 6⅝-inch casing set at 3350 feet. It is located in NWc NE Section 187, block "3-T," T&NO Ry. survey. In anticipation of important production being developed in this area, Phillips Petroleum Company is extending its Hutchinson County gathering system to the area, using about 17 miles of six-inch pipe. A. D. Morton et al. uncovered the field about three years ago, while a second successful completion for the area was made last April by Operators Royalty Company and Dana Oil & Gas Company.

Completions in Gray County registered an increase during the past week, but the majority of the wells were less than 500 barrels initial each. The Texas Company's J. E. Wright 5 made 1500 barrels and 6,000,000 cubic feet of gas from broken formation at 2720-2810 feet, but late last week had declined to 700 barrels daily, with 40 per cent water. Magnolia Petroleum Company's S. Faulkner 9 made 700 barrels oil and 4,000,000 cubic feet gas in initial gauge at 2825-40 and 2890-2910 feet. This gas production tested 1.19 gallons of gasoline per 1000 cubic feet. Shamrock Oil & Gas Company's Worley-Reynolds 1, located midway between the original Pampa, or Wilcox field, and the Bowers-Jackson area, swabbed 500 barrels on initial test at 2952-84 feet. The latter company has a contract to sell a maximum of 6,000 barrels of crude daily to the Borger plant at MacMillian Petroleum Corporation for five years, and has its own field gathering system, which delivers the crude to Phillips Petroleum Company for common carrier shipment from Gray County to Borger.

Judkins Output Limited to 10,000 Barrels by Lack of Market

FORT WORTH, Texas.—Accredited restricted production in the Judkins field, Ector County, failed to materialize during the past week when official proration gauges were taken by Umpire Ray Richmond in order that the area may be prorated under the jurisdiction of the Texas Railroad Commission beginning August 1. Expected crude market outlet for the field also fell short of expectations so the output of the field will be limited to 10,000 barrels daily, or approximately 50 per cent of the potential daily yield.

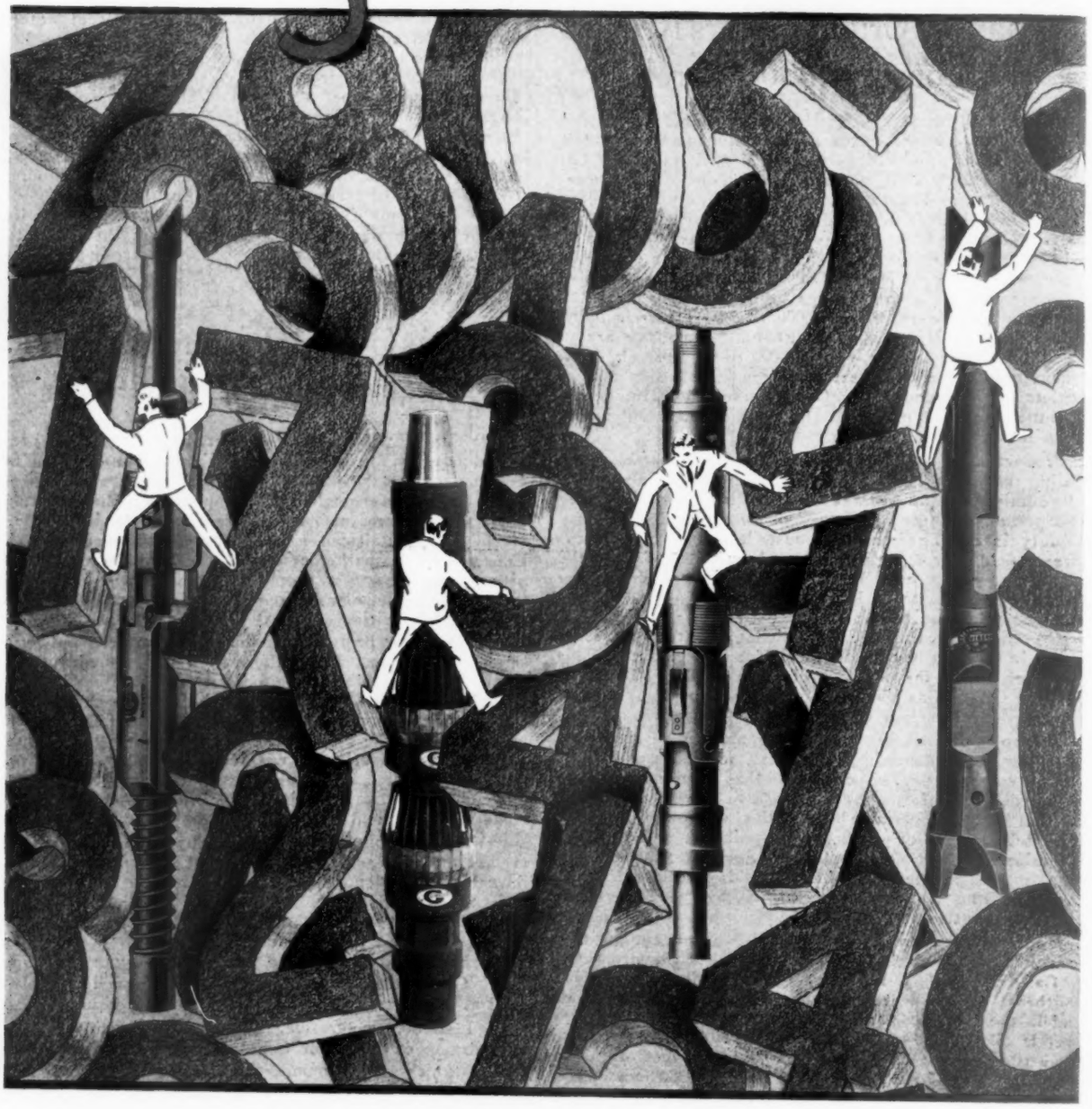
Application of proration to this field was preceded by a series of meetings, and authorization was issued July 21 by the commission after the majority of operators had endorsed the plan. Crude marketing difficulties experienced by a number of independent producers in the field was the motive behind the proration movement rather than heavy production, as pipe line companies connected with the area refused or limited their purchases and takings. This condition brought on uneven drainage, and forced oil from some leases to field storage.

Initial proration figures prepared by Umpire Richmond credits the field with 52 flowing and pumping wells that have a combined potential of 21,017 barrels daily. These wells are scattered over 32 separate 40-acre units. Production allowances for each unit are determined by average potential of all wells on same, and no allowance is made for acreage as has been the case previously in prorating West Texas areas. The above plan is patterned after that used at Darst field, but is not likely to have a similar fate.

W. L. Todd, vice-president Simms Oil Company, Dallas, is chairman of the Ector County proration advisory committee, which has a membership of five operators. This committee assembled in Fort Worth, July 24, and elected Ray Richmond, who has been umpire of the Yates field for a number of years, to the dual job. Richmond proceeded at once to the field and prepared his proration data, which was submitted to the committee during a special meeting held in Fort Worth, July 28. Formal reports on these two meetings have been forwarded by Todd to the commission.

Cosden Oil Company and Humble Oil & Refining Company each nominated 3000 barrels as their daily oil quota from the field, and Gulf Pipe Line Company nominated 2000 barrels. Burford Oil Company, which is the only exclusive buyer in the field, placed its requirements at 1500

WHAT STATISTICIANS



OF SPECTACULAR FIGURES

FIND AT THE BOTTOM

The task of ferreting out whys and wherefores is interesting to quite a lot of people . . . whether it be among bones and fossils or facts and figures. The sight of unusual records inspirits a statistician the same as the discovery of some rare specimen stirs an anthropologist, seeking facts on human origin. Both follow their leads to the bottom.

How often the former, who are interested in the oil industry, after seeking through a mass of astonishing numbers, uncover the name Guiberson! In drilling operations, this name is attached to the Guiberson Four Disc Reaming Rotary Bit, a wonder for speed and straightness of hole. Among records of populairty and wide use, based on merit, the Guiberson Flexible Cup Swab heads the list by doing most of the world's swabbing today. In the matter of preventing losses from accidents, the Guiberson Tubing catcher is responsible for hundreds of thousands of dollars. When it comes to prolonging the lives of wells and increasing production, the Guiberson Control Head Packer stands pre-eminent as a factor. In savings made by standing up under wear, strain and difficult conditions, the Guiberson Underreamer has earned its name as the "World's Strongest Underreamer."

Whether it be with any of these or with any of the rest of the Guiberson Line - - - the Bottom Water Plug, Tool Joint Tong, Oil Saver and others - - - phenomenal figures in performance are assured.

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BETTER BE SAFE THAN SORRY

barrels, while Shell Petroleum Corporation agreed to accommodate 400 barrels daily. Magnolia Pipe Line Company has a six-inch lateral line connected to the field, but is confining its runs to common carrier oil shipments conducted for Cosden Oil Company. Gulf Pipe Line Company is to run oil for Shell Petroleum Corporation and also take 325 barrels daily from Humble Oil & Refining Company, but such oil is included in above nominations.

Field activity has declined to only 18 drilling tests, and no new ones are getting underway, although some operators may attempt to place more units on production.

Ector County Proration

	No. wells.	No. units.	24-Hr. Potential Prod.	Total Produc. allowance.
Amerada Petroleum Corporation-Skelly Oil	2	1	1,217	499
Cosden Oil Company	10	6	4,911	2,281
Gulf Production Company	8	6	3,574	1,951
Humble Oil & Refining Company, et al.	18	10	5,752	2,505
Landreth Production Corporation	6	3	2,287	937
Shell Petroleum Corporation	1	1	762	623
Simms Oil Company-Phillips Petroleum Company	2	1	1,159	474
Skelly-Amerada	2	1	1,000	409
Skelly - Republic Production Company	1	1	20	20
The Texas Company-Cosden	1	1	185	151
Transcontinental Oil Company	1	1	150	150
Totals	52	32	21,061	10,000

Drilling At Van Resumed After Complete Shutdown

CORSICANA, Texas.—Resumption of drilling operations in the Van field after a complete shutdown of all rigs was made possible during the past week by the completion of a prolific water well on the Bogue farm, located near the Pure Oil Company's principal water station on the Jones land and southeast of Van. The original water line from this area to the heart of the field has been supplemented by the construction of 20,000 feet of 10-inch pipe. The field had 14 rotary rigs in operation early this week, and five additional tests were in the last stages of completion, while equipment was being installed on five other locations to be drilled immediately. Two completions made on inside locations within the unitized section of the field during the past week increased the total to 84. These wells are pinched in order that the output of the field may be restricted to 25,000 barrels daily.

Development of non-unitized acreage on the east side of the Van 5800-acre unit block is steadily gaining in volume, and drilling operations are conducted by each lease owner. Pure Oil Company is the sole operator in the Van unit, and is sharing honors with Humble Oil & Refining Company for lease ownership of virtually oil proven acreage on the east side of the pooled area. The Texas Company, which is the third largest property owner in the unit, with 4.51 per cent., has been a holdout on taking part in the formation of a second unit, and is to complete its first well on the east side of the field this week. The latter company's G. W. Carter 1, located due east of Humble Oil & Refining Company's E. E. Correll 1, which opened up the new territory for development, was drilling cement plug early this week after coring into oil saturated sand at 2806 feet. Pure Oil Company's M. L. McMahon 1, a south offset to Carter 1, is ready to spud. Imperator Oil Corporation et al have been enjoined by The Texas Company from completing a wooden derrick on an alleged vacancy strip of land between Carter 1 and the producer on the Correll farm.

Humble Oil & Refining Company has elected to scatter development work in the non-unitized area, and has moved in materials to drill on the lower part of the Ruth S. Blake 201.4-acre lease, instead of taking care of two necessary offsets that must be drilled shortly in the northeast corner of the tract because of the Correll and Carter tests. Blake 1 has been located 640 feet from the south line and 250 feet from the most westerly east line of the farm. Pure Oil Company's L. York 1, has been staked as a direct east offset to Blake 1. Humble Oil & Refining Company's J. A. Freeman 1, located against the southeast edge of the Van unitized area, has been abandoned as a failure at 3500 feet. Due south of these new locations, Broderick & Calvert have a derrick up to drill on a 2.07-acre vacancy strip, while further south a derrick is being erected by Geo. Anderson and Associates on an alleged vacancy strip in the northwest corner of Humble Oil & Refining Company's Sanger lease.

No Control Over Strip Owners

Members of the Van unit plan have orally committed themselves to produce oil in the non-prorated area on the same basis that production is restricted in the main field, but no control over the strip owners is possible. The latter group expect to make use of tank cars on the recently completed railroad extension to Van as a market outlet. However, these developments are quite likely to embarrass the future success of unitization at Van.

Previous records for oil sand thickness in the Van field have been shattered by Sun Oil Company's I. W. Thompson 4, located about 1500 feet northeast of the discovery well, and the biggest producer in the field is anticipated from this test. Thompson 4 logged the top of the main oil formation at the highest point in the field, and after drilling to 2390 feet shut down to cement seven-inch pipe above the oil horizon at 2340 feet. This well has been drilled to 2965 feet, and logged approximately 600 feet of oil saturated sand, with occasional breaks in the formation. Liner and tubing had been installed in the well early this week to place same on production, but no open flow will be taken of the production in accordance with operating methods practiced without exceptions in the unitized area.

Royalties will begin accruing for members of the Van Methodist Church as result of Pure Oil Company having completed a flowing well on the 1.67-acre church site during the past week, with an initial flow of 208 barrels at 2590 to 2929 feet. This production gauge was taken through small choke, and actual potential is estimated at about 3500 barrels daily.

Line to Serve Wheat Field

San Angelo, Texas.—Direct pipe line connections are to be made by the Pasotex Pipe Line Company with the Wheat field, Loving County, which is the only important oil area in West Texas solely dependent upon tank car shipments for crude outlet. This field has been producing 38-40 gravity sweet oil since its discovery in September, 1925, from the 4200-foot Delaware formation, but has had slow development until this year. Production is now averaging about 1850 barrels daily.

Pasotex Pipe Line Company is building an eight-mile combination four- and six-inch lateral from its West Texas eight-inch trunk line, which extends from Winkler County to El Paso. A field station will be erected on The California Company's Reagan-McIlvain producing lease, where three tests are under way, and will deliver the production of the latter company to the El Paso refinery of Pasotex Petroleum Company. All three concerns are fully owned subsidiaries of Standard Oil Company of California. Lockhart & Company, pioneer operator in the Wheat field, is now handling the entire output of the field in tank cars and paying 25 cents per barrel below Mid-Continent gravity scale prices. This oil is shipped to the El Paso refinery of Rio Grande Oil Company. Arrangements may be made for the entire output of the field to be handled by Pasotex Pipe Line Company to El Paso, as the carrier is operating at low capacity.

Darst Creek Proration Collapses; Production Jumps

SEGUIN, Texas.—Proration, which had prolonged production curtailment at Darst Creek, Guadalupe County, for nearly a year following discovery of the field, but which had maintained a precarious existence for several months, finally collapsed last week in spite of intervention of the Railroad Commission of Texas, and with production still increasing, the output of the pool had jumped by the end of the week to a daily total estitmated at about 75,000 barrels. Since May 1 the production had been held down to approximately 25,000 barrels daily, while prior to that date the average had not exceeded about 16,000 barrels daily. The potential production of the field, based on the last one-hour gauges of wells, taken July 1, was 191,063 barrels daily from 152 wells, and those figures are exclusive of half a dozen fault producers one mile north of the main field and several wells in the main field completed during July.

Although the above potential is artificial to some extent, being based on short gauges, the field is conceded to have a high actual potential by virtue of having been rigidly controlled since its discovery, and with non-adherence to the Railroad Commission's recently ordered proration rules spreading throughout the field the only limit to production now, apparently, is the physical restraint offered by facilities for handling the oil on bringing it to the surface. Such a limit under emergency can possibly be stretched to 45,000 or 50,000 barrels daily, figuring only the present tank car marketing facilities and the existing or virtually completed pipe lines serving the field. In addition there are half a dozen new 80,000-barrel steel tanks in the area just finished or near completion, while there is the prospect of increased tank car shipments, with a railroad running within a few miles of the north end of the field.

Gulf Pipe Line Company, which has virtually completed construction of four 80,000-barrel tanks as well as its new 200-mile eight-inch carrier from Darst Creek to Sour Lake, will be in position to handle possibly 15,000 barrels of oil daily, especially if it decides to increase pumping facilities along the line. Humble Pipe Line Company likewise has an eight-inch line from the field, extending to the Baytown refining and shipping center of Humble Oil & Refining Company on the coast, and therefore has physical capacity for handling about the same amount as Gulf Pipe Line Company. Texas Pipe Line Company has been moving around 9000 barrels daily from Darst Creek to its West Texas-Gulf Coast trunk line by way of Rosanky station, operating the lateral line to the field near capacity. Louisiana Oil Refining Corporation has a 3½-mile six-inch line from the field to tank car loading rack north of the field and can readily handle 5000 or more barrels daily. Magnolia Petroleum Company has a line from the field to its Luling district tank farm and can handle 12,000 barrels daily. Harrison & Abercrombie are protected on their production to the extent of having two completed 80,000-barrel steel tanks in the field.

The only prospect of production restraint aside from that offered by a taxing of marketing facilities lies in further action of the Railroad Commission.

Injunction Started Collapse

Failure of the state-enforced proration program, instituted July 15, was precipitated July 22 when Judge George Calhoun of the Fifty-Third District Court at Austin granted Harrison & Abercrombie et al a temporary injunction restraining the Railroad Commission from continuing its proration order as regarding those interests' leases at Darst Creek. The suit constitutes the first litigation testing the new pipe line and common purchasers law, under which the field was ordered prorated. The next step, unless the state elects to await the hearing of the case on its merits in its docket order, will be a motion to dissolve the injunction. In this connection, it will be recalled, several operators in Winkler County, West Texas, restrained the Railroad Commission from enforcing a proration order for that field through temporary injunction when proration had been under way about six months, and even to now that temporary injunction in Winkler County has not been dissolved. The commission did not elect to go to court then, but now with the new pipe line law to rely on it may take action.

No details have been made public by the Harrison-Abercrombie interests regarding their action in opposing the enforcement of the Railroad Commission's order, but it is reported that they are acting under contention that they are forced to open up their wells to protect themselves against excessive drainage by wells on offset acreage. The adjacent land involved is held under lease by Louisiana Oil Refining Corporation. That concern bought its Darst Creek properties under terms of a contract providing for partial cash payment and partial payment out of oil as produced, with stipulation that daily production be at least 4500 barrels daily. Under that contract the company was unable to restrict production within the bounds required under the state's proration program, and as further defense in such litigation as it may be involved in the company is expected to show that it is depending largely on the Darst Creek crude supply to keep its Shreveport, Louisiana, refineries in operation, meanwhile transporting all the oil by tank car to the refining center. The company was reluctant to enter the voluntary operators' agreement curtailing Darst Creek production when it entered the field last April, but decided to participate, with its allowance not interfering seriously with its requirements. Under the state-controlled program, however, it was alleged to be producing more than proration allowance.

South Texas Oil in Demand

Houston.—While practically every other field in the United States is having to talk curtailment, proration and over-production, the Muckleroy field in Zapata County and the 3700-foot pay sand in the Refugio field are being pushed to maximum production and are still unable to supply the demands of crude oil purchasers.

Keen competition for pipe line connections in these two fields has been experienced during the last few weeks, where the posted price of crude is 85 cents a barrel. The reason for this unusual demand is because of the peculiar qualities possessed by these grades of crude. They are said to contain properties which go to make the high test gasoline now in demand. The Zapata crude is said to require very little treatment in order to bring out these qualities and the Refugio crude contains the same properties in large quantities which are easily obtained through the ordinary cracking process.

Gulf Coast and South Texas Fields

JACK LOGAN, *Staff Representative, Houston, Texas*

New Wells at Barbers Hill Have Larger Initial Flow

HOUSTON.—Completions at Barbers Hill for the week show a decided increase in initial production with Yount-Lee Oil Company's Fisher 2 coming in for a flow of 1500 barrels of 31 gravity oil from a depth of 5720 feet and Sun Oil Company's Wilburn 7 flowing over 500 barrels daily. McAlbert Oil Company's Woodward 1 was completed for a flow of 800 barrels, shut in through ⅜-inch choke.

Efforts to make a producer of Shell Petroleum Company's Herff 1 on the southeast side of the Moss Bluff Dome in Liberty County were indefinitely delayed when the derrick was pulled in while efforts were being made to break casing, which was stuck in the hole. Pay sand was encountered in the well at around 5825 feet, but continuous quick sand caving made setting of screens hazardous and attempts have been made for some time to mud and cement off the quicksand.

Gulf Production Company completed its Boyt 7 the first part of this week for an initial flow of 400 barrels from 4100 feet. Several wells have been abandoned in the Gulf Coast section during the past week. Chief among these are McInnery and Harris' Hattie McDade 1, abandoned at 500 feet in sand; The Texas Company's Pipkin 3, in the Big Hill field, abandoned in anhydrite at 1677 feet; and Pure Oil Company's Kirby 1, at 6669 feet in shale.

Humble Oil Company's Sabine Tram 1, drilling in sand and shale at 5801 feet is being abandoned and rig is being torn down. Abercrombie and Harrison have completed a workover in the North Dayton field originally drilled to 5043 feet. The well came in last Saturday flowing 1130 barrels of 42.6 gravity oil. The Texas Company's Ewing 1 is approaching the pay sand in the Manvel area in Brazoria County and is drilling at a depth of 5964 feet in sand while Mills Bennett's Barrow 10 in the Barbers Hill field is drilling at 4672 feet, with 2177 feet of four-inch pipe cut and pulled. Sun Oil Company's Chambers County 6, has hit salt at 2513 feet.

Complete Five Producers in Vinton Pool

HOUSTON.—Completions in the South Louisiana field last week marked the high spot in the Gulf Coast section and practically captured the honors for field operations. Five producers completed in the Vinton field yielded 5100 barrels initial new oil.

Gulf Refining Company completed two wells in the Vinton field, Gardiner 2, flowing 1400 barrels from 3450 feet and Gardiner 3 making 2150 barrels from 3440 feet. Wilson & Broach No. 3 flowed 800 barrels, 10 per cent water, from 3480 feet while Supreme Oil Company's Gray 7 is now being operated as a pumper of 250 barrels from 2900 feet.

Port Barre field had only one good completion last week with the bringing in of The Texas Company's Botany Bay 8, flowing 1000 barrels from a depth of 3380 feet. Alex Rice's Futral 1 was abandoned in salt at 4600 feet. Standard Oil Company's Schwing 5 made 200 barrels from 2300 feet in the Bayou Blue pool. The Texas Company's Lake Barre State 4, in Terrebonne Parish, came in with an initial flow of 1200 barrels daily from a depth of 3660 feet.

The Texas Company's Rayne Heirs 5, in the Evangeline field, is still drilling in sandy shale at 8578 feet with no bright outlook for pay sand. This is one of the deepest wells in the Gulf Coast section. Yount-Lee Oil Company's Houssiere-Latreille 9 is down to 4600 feet and is drilling in water sand. Considerable encouragement has been found in the fact that there is a good oil showing in the Union Sulphur Company's Fee 734, which is down 4569 feet. The same company's Fee 756 has pulled the screen, depth being 4773 feet. Pure Oil Company's Yount-Lee 9 has also had a good oil show at 6813 feet.

Operations in Cameron Parish are going forward at full speed with a good show of oil in Yount-Lee Oil Company's Portia 1 at a depth of 3778 feet. Whipstock was set and hole was milled out at 3675 feet, but screen was not reset. Moon Oil Company's Sannier 5 is down 3171 feet with a showing of oil. Six and five-eighths-inch casing has been set at 3150 feet and one joint of 4½-inch mesh screen has been set but the well would not flow. Water sand has been struck by Federal Petroleum Company in its Herbert 1 at 5653 feet and by The Texas Company's State Vermilion Bay 5 at 4438 feet. Rycade-Humble's Bayou Bouillon 10-B has a good show of oil at 4287 feet and casing has been set at 4260 feet.

Cosden's McKinney 2 Sets Record for Pettus

HOUSTON.—The largest oil well of the Pettus field, Bee County, was brought in on the morning of July 25 when Cosden Oil Company's McKinney 2 began flowing 90 barrels of oil per hour through two-inch tubing and one-half-inch choke from sand at 3669-81 feet. This producer was drilled on contract by the Merrick Drilling Company of Wichita Falls.

In the meantime Cosden Oil Company's McKinney 1, which extended production some weeks ago three miles west of the original Pettus oil pool, continues to make about 265 barrels of oil and 500,000 feet of gas daily.

Gulf Coast Pipe Line Company, affiliated with the Union Producing Company as part of United Gas Corporation, is taking oil from Cosden Oil Company's McKinney 1, but cannot market oil from No. 2. Consequently Cosden Oil Company is considering erection of an 80,000-barrel steel tank, but has not yet bought it.

Cosden Oil Company's McKinney 3 was running liner and tubing to test pay at 3655-68 feet late last week. In the same pool, the Baytex Oil Company's Burnett 1, completed at 3631 to 3645 feet, with production of 15,000,000 to 20,000,000 feet of gas and 45 barrels of oil the first day, has increased its flow to 105 barrels per day. The Pettus Townsite has the greater amount of attention at the present time with Al Buchanan's Townsite 38 hitting the pay 3915 feet, while Rio Bravo's S. A. & A. P. 7 has picked up what is thought to be the cap rock at 3888 feet which if proved to be on the right side of the fault line will make a very good test well. S. R. C. Oil Company's Townsite 37 is hitting pay sand at 3897 feet and is setting pipe at 3903.

While completions are going forward steadily it is noted that there are now 16 producing wells in the Pettus field which are producing 6550 barrels daily. The largest producer is the Union Producing Company with six wells making 2820 barrels daily while Humble Oil & Refining Company is second

with four producers. Other producers are Houston Oil Company, Cosden Oil Company, Barnsdall Oil Company, Batex Petroleum, Glasscock Brothers, and C. F. Nichols et al. A major carrier in the Pettus area claimed the report of crude oil price being cut to $1 was erroneous. It was believed that the report gained circulation in an offer for pipe line construction to relieve storage if the oil could be purchasedfor $1.

Renewed interest in drilling activity in Bee County has been noted with the announcement of 12 new locations, most of which belong to Union Producing Company. These locations are in addition to the 20 locations made along the Southern-Pacific right-of-way by Rio Bravo Oil Company within the last few days. With the announcement of these locations comes the news of expected development of a new field in the northern end of Bee County. The suspected area is near Normana, a full mile and a half north of production. The test which raised hopes of new oil territory in Bee is Henshaw Brothers' Beck 1. It drilled a sand at 4200, which showed a small amount of oil and considerable salt water. The well is shut down for orders, but the oil show encountered in it will undoubtedly result in further drilling in that section. This interesting wildcat is north of the Hicks wells, one of which is a dry gasser, another showing about 25 barrels of oil daily, while the third is drilling around 3800 feet.

Wild Gas Well in Refugio Field Still Uncontrolled

HOUSTON.—Attempted control of Houston Oil Company's Strauch 1, Block 20, at Refugio, which blew in June 25 as a wild gas well, has assumed such serious proportions that representatives of Houston Oil Company, the well contractors and citizens of Refugio were scheduled to meet with the oil and gas division of the Texas Railroad Commission at the state capitol in Austin Monday, July 28, to discuss ways and means of subduing the well.

All efforts so far to control the monster gasser have been futile and as a result the oil and gas division of the Railroad Commission has had to take over the supervision of the well. Their efforts to control it have brought no improvement in the situation. It is believed that the meeting July 28 may result in extreme measures to either kill the well or attempt to again put it in subjection.

Estimates of the well place the flow of the gasser at 50,000,000 to 140,000,000 cubic feet of gas daily. These are all purely guesses because no means of gauging the flow has been established. Common belief among the experienced oil men is that a crater is the only salvation but if this were to occur it would automatically kill the well.

The enormous pressure and flow of the gas has caused the ground around the well to heave and roll, and small gas fumes are breaking through the earth all around the hole. A 35-foot length of 6⅝-inch casing sticking out of the hole is being whipped around like a weed in a whirlwind.

A brown-colored oil sand is covering the surrounding country and the air is filled at intervals with this sand spraying from the well. Many residents in the vicinity of the well have been forced to move because of fear of the well cratering. An area of two blocks around the gasser has been roped off and all smoking and fires of any kind have been prohibited.

Other wells of interest in the Refugio field are the Mission River 1 which is showing oil from 3660 feet with 3000 feet of oil standing in the hole and prospects of becoming a good pumper. Houston Oil Company's Rose Lambert, which is down 5905 feet is pulling liner and screen, while the West 1 of the same company is preparing to make a drill stem test at a depth of 5469 feet.

Only two completions were made in the Refugio field for the week, these being Independent Oil & Gas Company's Mitchell 1, abandoned at derrick, and Edwin M. Jones, J. F. B. Heard 4-A, which is flowing 300 barrels daily through a 5/16-inch choke under working pressure of 75 pounds and from a depth of 3661 feet. Mission Drilling Company has been working in oil and gas sand at 5469 feet on Joe Shay 1. 6⅝-inch casing has been set at 5462 feet. Saxet Oil Company's Kay 1 has entered oil sand at 3693 feet and is preparing to set 9⅝-inch casing at 3678 feet.

Several wells located within a few blocks of the wild gasser are reported showing diminished pressure and three wells have gone entirely dead. It is believed that the gasser is responsible for the action of some of the wells. New developments in the cratering of the ground around the gasser has led to the general belief that the well will automatically bridge over and shut in naturally. A foot crater was blown around the well last July 26 and the well has been observed to be "coughing" noticeably due to heaving formations below the surface caused by a pressure of 2200 pounds.

Mirando Section of Southwest Texas Attracts Attention

Houston.—The Mirando section in Southwest Texas is getting a lot of attention from the independent operators with the threatened initiation of two new producing spots. The Muckleroy field, which now boasts more wells drilling than the older section, is in close proximity to this new development. The new oil areas are located where surveys 569, 560, 661 and 662 corner on each other in Webb County. Several new wells have been completed by Magnolia Petroleum Company and W. G. French, owners of the acreage, and even greater production is expected to be developed than is produced by the seven existing wells. The Cole field, four miles southwest, has a production of 3000 barrels daily; and while the new French field is not expected to add many wells, it will no doubt help increase the daily production of the Mirando area considerably.

National Oil Company's Howard 1, another new spot for the Mirando section, topped a sand at 1170 feet that shows mainly gas, but also carries considerable oil. The well is a pure wildcat, being 12 miles west of the old Mirando Valley field, which is the nearest production and means the opening of a new field for Zapata County. This well blew in and cleaned the hole at 690 feet. Due to the showing found, the area surrounding it is to be most thoroughly tested.

In Medina County, National Oil Company's Howard 1 has 35 feet of saturated sand with the cores showing the best test that has ever been found in the Taylor marl. This test is two miles southwest of the Adams gas field and five miles northwest of Devine.

Vinton Field

Houston.—Gulf Refining Company has just completed two new wells in the Vinton, Louisiana, field for a total production of 3600 barrels daily. The company's Gardiner 2 is making 1500 barrels of 26 gravity oil through a three-quarter-inch choke from 3410 feet. Preparations are being made to set strainer at 3425 feet. The company's second producer, Gardiner 3, is making 2100 barrels of pipe line oil from 3450 feet.

Danbury Dome

Houston.—Shell Petroleum Company having failed in its shallow test, Blakely-Winston 3, has made location for Blakely-Winston 4, which is to be drilled south of No. 1, the well which proved the dome by drilling into the salt at 5150 feet. An oil sand was passed through at 1700 feet and it is probable that the well will be developed for about a 50-barrel daily producer at the 1700-foot level if other shallow tests are successful and storage is erected.

Drilling operations for the new well will start within a week. The location for No. 4 is 2040 feet northeast along the southeast line and 220 feet at right angles to the same line from the southwest corner of the Blakely-Winston 522-acre lease.

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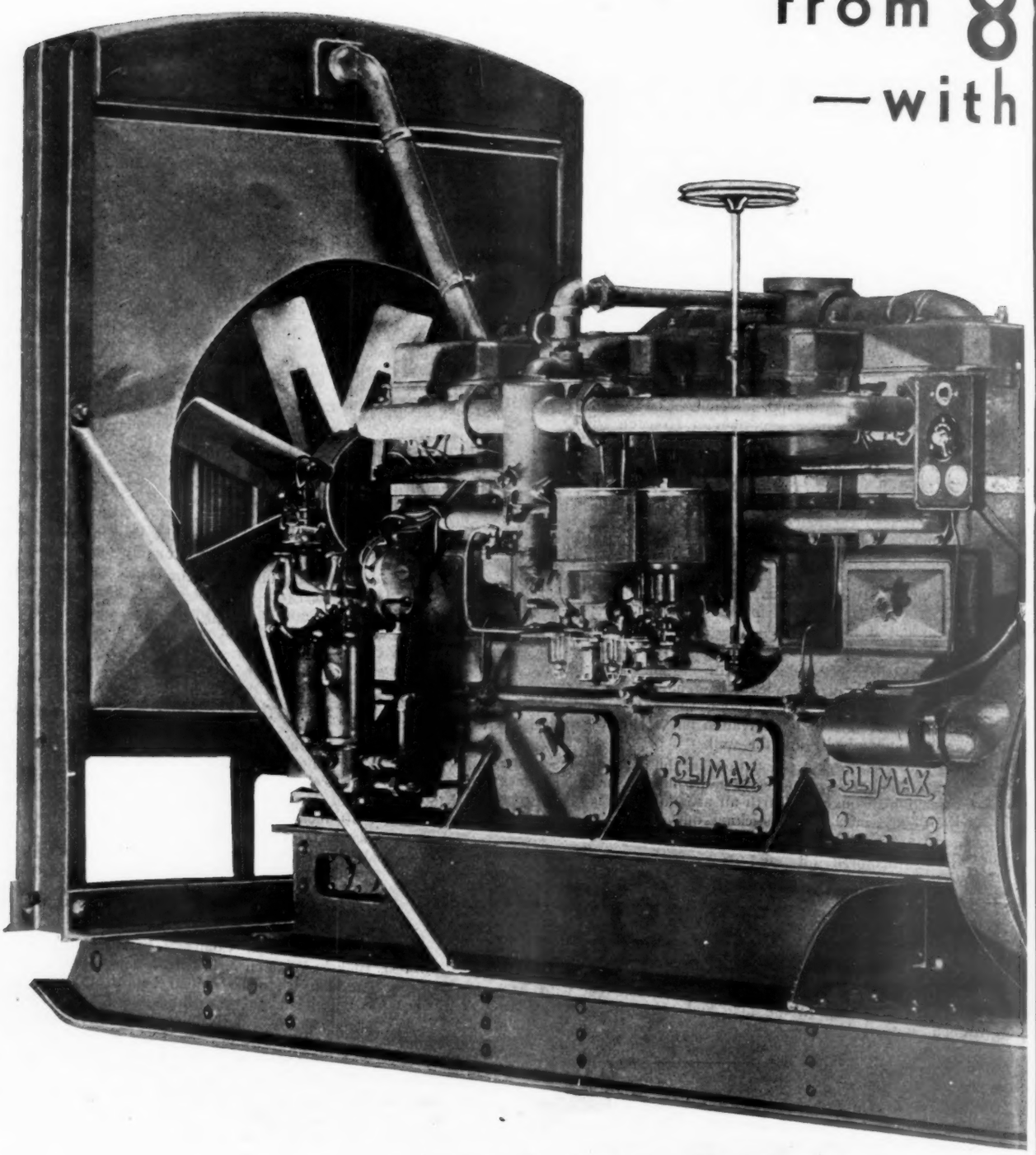

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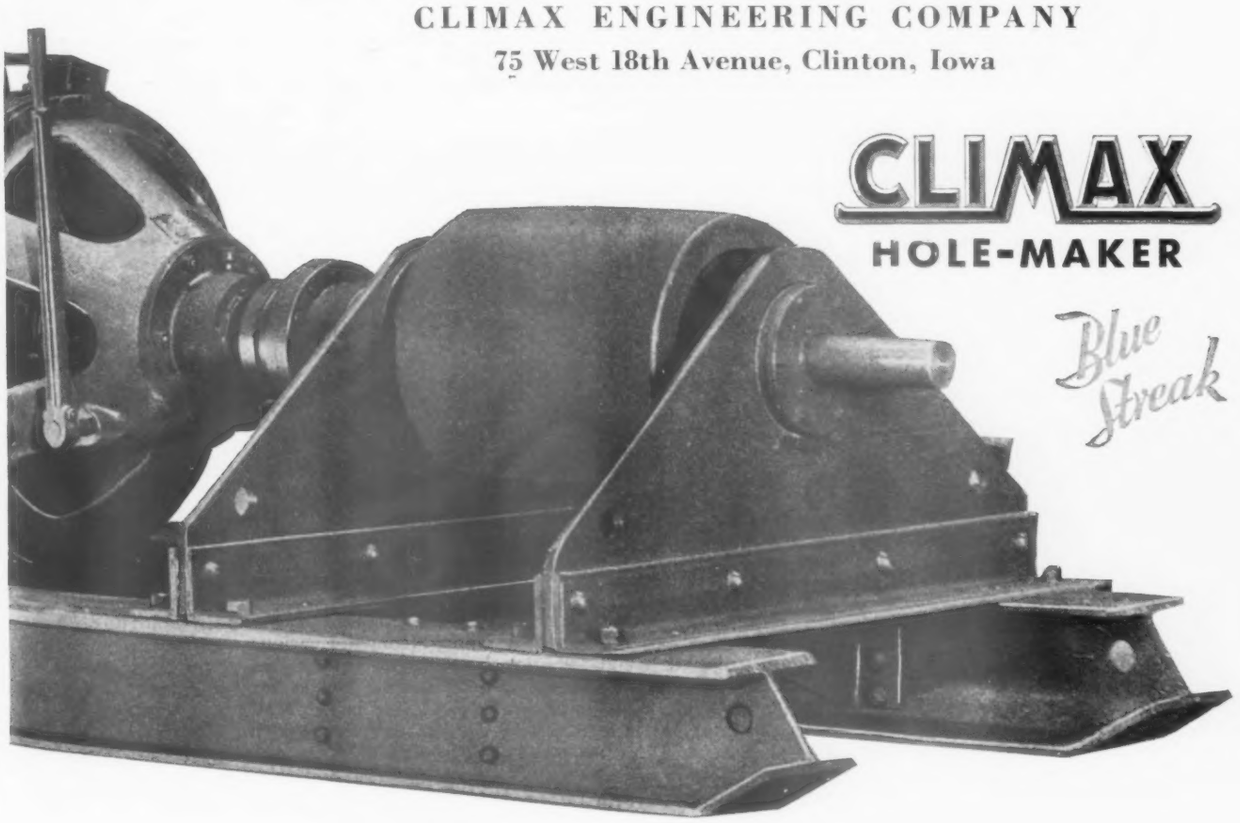


News From California Fields

BRAD MILLS, *Staff Representative, Los Angeles, California*

Uncertainty in Marketing Conditions Oppresses California Oil Industry

LOS ANGELES.—Most anything can happen in California during the rest of the year, with indications that proration will hold up over the state, with a question mark as to the new Venice-Playa del Rey field, and the industry faced by the possibility that another gasoline price war is in the offing.

The general situation in marketing circles may change for the better in another week or so, but the feeling at this time is not very optimistic. The number of independent service stations selling gasoline at retail at 12½ to 17½ cents against a prevailing price at the major company stations of 19½ cents is showing an increase, with sales departments of oil companies, big and little, doing lots of hard thinking.

The livest field at this time is the Venice-Playa Del Rey area, some 51 miles from Los Angeles on the ocean. During the past week three new wells were completed with initials close to 2000 barrels. They came from the deeper zone, and to the south, indicating that the field has a trend in that direction. About 10 days ago, one company quit-claimed about 60 lots in the townlot area, and this week, other companies are seeking the same lots. It is impossible to get two or three oil men to agree as to where the production will extend.

No price has been posted for the crude in this field. Much of the oil is being hauled out in tank trucks with reports going the rounds that one small lot sold at 50 cents, while another small refiner was offered a fair quantity of crude at 65 cents. The production from the deeper zone averages around 24 gravity. A recent refinery analysis of some of the deep zone production indicated that it had a U. S. motor gasoline content of 26.3 per cent. The sample was 24.6 gravity, cut one per cent, and the sulphur content was slightly better than two per cent. At first it was reported that refiners did not care for this crude, due to its sulphur content, but later reports indicate that several refineries are not adverse to running this crude, along with other refinable crudes.

As of July 24, there were 32 actively drilling wells in the Venice-Playa Del Rey field, with 10 rigging up, five idle rigs and 10 locations. Superior Oil Company's Moses 1 came in for 1200 barrels of 24.2 gravity oil from a total depth of 5640 feet. Geo. F. Getty's Venice 1 made 2200 barrels first day from a total depth of 6205 feet. The Superior well is in the south end of the field, and its success has turned the attention in this direction. Union Oil Company's Del Rey 1, also in the south part of the field, is showing oil, but lost a swab, delaying its completion. Union Oil Company controls most of the south end of the field, two leases alone totaling about 700 acres. If the big production is in the south end, larger leases will prevail.

Union Oil Company is building a line into the field and Del Rey Oil & Refining Company is now building a gathering system in the field to take the production from several wells, which is to be stored. Production is now being taken from two wells and others probably will be connected up. It is understood that for the present this company will use some of General Petroleum Company's tanks at Torrance to store the oil, although this will be only a temporary arrangement. The Del Rey Company is to build a natural gasoline plant at once, and rumors are to the effect that a refinery will be built later.

Three Elwood Completions

Three good wells are recent completions at Elwood, out in the ocean, in Ventura County. Signal Oil & Gas Company's State Permit 98-2 started flowing by heads from only 30 feet of sand, extending the field 1000 feet to the northwest. Pacific Western Oil Company's Permit 92-5 started out making 4000 barrels of 37 gravity oil and 6,000,000 cubic feet of gas from a total depth of 3474 feet. Barnsdall-Rio Grande's Luton-Bell 13 had an initial of 2000 barrels at 3452 feet.

At Huntington Beach, Barnsdall Oil Company's Borchard 1, a deep test in the extreme southeastern part of the field, has been abandoned at 6720 feet. Ninety feet of oil sand was picked up at 5600 feet but failed to produce on a test. Two other deep tests for this field are now drilling and others are reported under contemplation.

Only 23 wells are now drilling at Ventura Avenue, 12 of this number by Associated Oil Company. Twenty drilling wells stand suspended and there are 11 rigs in the field. Due to the shut-in movement, 105 producers are idle, with only 145 wells on production and many of these are pinched in. The field is now making around 150,000,000 cubic feet of gas daily.

There are only 15 wells actively drilling at Santa Fe Springs.

A. P. I. Committee on Waste Disposal Meets in Los Angeles

Los Angeles.—The American Petroleum Institute's committee on disposal of production wastes met in Los Angeles, July 22 for a three-day session under the chairmanship of V. L. Martin, Prairie Oil & Gas Company, Independence, Kansas, at which the work of the body was outlined in detail. Others present included: Norval White, A. P. I. representative in California, secretary; H. B. Haney, San Francisco, Associated Oil Company; M. E. Brock, Houston, Gulf Production Company; S. W. Oberg, Houston, Humble Oil & Refining Company; Wm. F. Taylor, Tulsa, Carter Oil Company; H. H. Anderson, San Francisco, Shell Oil Company. The guests included L. M. Miller and L. H. Young, Los Angeles, Union Oil Company; H. W. Wickstrom, Los Angeles, Associated Oil Company and A. S. Russell, Los Angeles, Standard Oil Company of California.

The committee met in closed session July 22 in Los Angeles to hear reports from the various members, with special attention being given to disposal plants in operation in California. The second day was spent visiting disposal plants in Southern California, while the third day included a visit to the Ventura Avenue and Elwood fields.

Special reports will be placed in the hands of the chairman by the individual members, looking to the formulation of a "Manual on Disposal of Production Waste."

while 22 wells formerly drilling, are standing idle; and 69 more rigs are idle due to bad holes, etc. Deep zone wells to the number of 74 are completely shut in, and 135 shallow producers are idle to reduce the production of the field to the allowable figure. One of the major companies last week was forced to discontinue repressuring on account of the shortage of gas.

Continental Oil Company at Seal Beach drilled into what some have termed a new sand, while others call it the second McGraw. The production was exceedingly small, due to it being on the edge of the structure. Two other wells recently were drilled into this sand, but they are also on the edge and the production was extremely small. Since the acreage in the main part of the field is held entirely by three large companies, much activity is not expected.

Some interest is being shown in a well about to be completed in Lime Canyon in the Piru district, Ventura County, in the area where Pacific Western Oil Company has two wells on production, making refinable crude. Bolsa Chica Oil Corporation's test is drilling below 2450 feet, with oil of 23 gravity coming up between the 4½- and six-inch casing.

Eight-Year Old Long Beach Field Has 2700-Barrel Producer

LOS ANGELES.—Long Beach, nearly eight years old, and the home of the first real and continuous deep drilling in California, continues to furnish wells with large initials, reporting a new producer recently which came in at the rate of 2700 barrels of pipe line oil from a total depth of 7000 feet. Dabney-Johnson's No. 52, located on the southwestern flank of the field, furnished a real surprise in making 2700 barrels and is drawing further attention to this area.

Some months ago, a renewed drilling campaign started in the Los Cerritos area, the scene of a big town lot drilling campaign about three years ago, with small operators taking the lead. Two recent completions in this area furnished only 600 barrels initial, average, and they were drilled to around 7000 feet. Such wells do not hold up well. The poor initials has caused several wells to be shut down, and probably will never be completed.

The number of drilling wells at Long Beach will range from 65 and 100 between now and the end of the year, and the field will hold an important place in the production column of the state for several years at least. Operators in the field are very numerous, due to town-lot conditions; and pumpers are holding up surprisingly well. Practically all of the operators are shutting back production in keeping with proration plans.

Long Beach came into the limelight in California in 1922 and has been holding its own and has proved to be most consistent producing field in Southern California since that time. The years 1923 and 1924 were big years, but peaks in production have been reached since that time, with number of drilling wells going up and then down, but never holding below 50 through the years, except in 1926, when the drilling wells at end of year fell to only 22.

Activity at Long Beach this year is again reviving, with the number of active drilling wells in June totaling 85. In view of the continued activity the following table will be of interest:

Year or month	No. of Completions	No. of Drilling wells*
1925	105	123
1926	259	22
1927	48	94
1928	245	146
1929	192	63
1930—		
January	7	64
February	5	81
March	19	67
April	15	67
May	11	85
June	8	85

*End of period.

Reduced Pipe Line Takings Cut Howard-Glasscock Output

DALLAS.—Prorated wells in the Howard-Glasscock County district must return to a flat productino allowance beginning August 1 as result of pipe line companies having nominated only 10,615 barrels as being their combined daily requirements for the new period. Crude nominations were 17,083 barrels for July.

A resolution was prepared by the proration advisory committee recommending that the Texas Railroad Commission order the output of the field cut to conform to reduced nominations of pipe line companies as a climax to a special meeting held here July 28 with M. B. Sweeney, chairman of the committee, presiding. The resolution also requested the commission to alter the proration rules in regard to fixing production quotas of companies based on acreage and potentials, and place a flat production allowance of 50 barrels daily per well for those in the Coffee-Phillips, or west field, while deep wells in the Roberts-Settles, or east field be allowed to share equally the remainder of the remaining market outlet.

It is estimated that wells in the Roberts-Settles area will be allowed to produce about 77 barrels daily maximum each.

Nominations by pipe line companies for the new proration period follows: Shell Pipe Line Company 5000 barrels; Humble Pipe Line Company 2500 barrels; Magnolia Pipe Line Company 915 barrels; Cosden Pipe Line Company, 500 barrels; Big Spring Refining Company, 500 barrels; Great West Refining Company, 800 barrels; and Coltex Refining Company, 400 barrels.

Cosden Pipe Line Company made the largest reduction in nominations, and had been the largest buyer of prorated oil in the field, but on July 20 began paying for only one-half of the oil run, with the remainder going to storage at expense of producer. However, the company will quit storing oil and restrict its takings to actual requirements.

Southern Oklahoma

Tulsa.—The Tatums District, 1s-3w, Cater County, continues to lead that part of Oklahoma in drilling activities. Trevelyn Oil Company's Mitchell 1, SW NW SE, Section 24-1s-3w, which extended production one-half mile southeast when completed two weeks ago, is producing at an average of about 1500 barrels.

This well had an initial production of slightly more than 2300 barrels. C. L. Anderson's Eaves 2, CNW NW SW, Section 24-1s-3w, one location north and five locations west of Mitchell 1, swabbed 150 barrels during its initial 24-hour gauge from a series of sands between 2335 to 2640 feet. Two tests are cemented on sands, three are rigging up rotary tools, and 10 are drilling.

Tulsa Geologists

Tulsa.—At a regular meeting of the Tulsa Geological Society, held in the Tulsa building, Thursday, July 24, members were treated with a geological report on the Hobbs, New Mexico, field. Earl Trager spoke briefly on the preliminary geophysical work and was followed by Tom Newman, Skelly Oil Company, who presented maps showing the general location of the pool and structural contours on two of the horizons. The industry is carefully watching this pool in view of its possible market threat and any definite information such as that given by Trager and Newman, is of special interest to those not in close contact with operations.

Tulsa.—The Burbank Chapter, American Petroleum Institute, Division of Production, will hold its monthly meeting on August 13 at the Sinclair Community House in the field. Lubrication is the subject for discussion and a good attendance of engineers and field men is expected.

OKLAHOMA CITY

Always the Trade Center, Now the Leader in Oil

For more than a quarter of a century Oklahoma City has not only maintained its leadership in the state in population, but has likewise reigned as the manufacturing and distribution center.

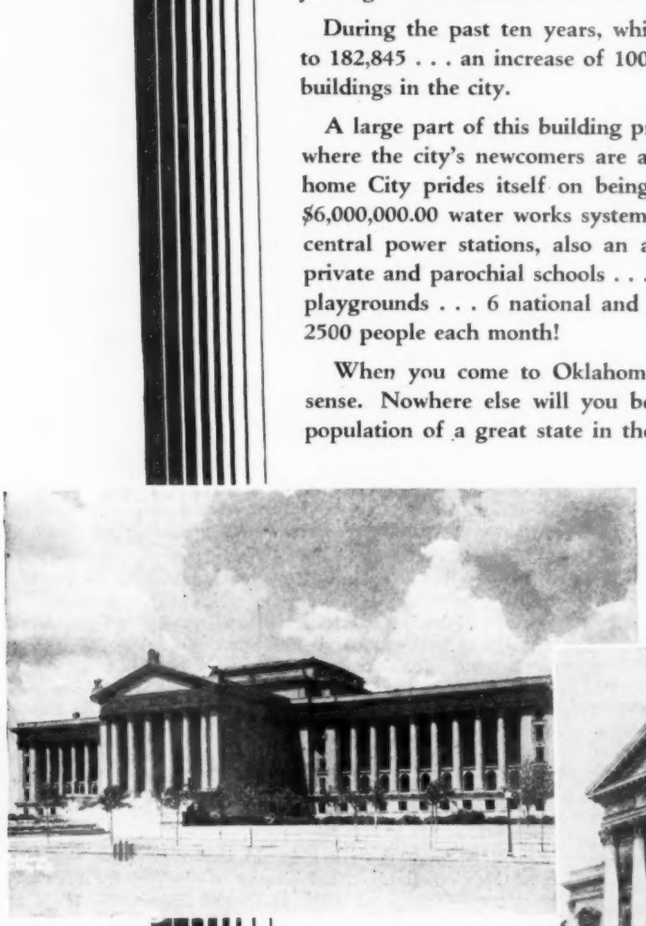
Strategically located in the geographical center of the state, and the prosperous area known as the Great Southwest, with seven trunk line railroads operating 164 passenger and 64 freight trains each day, Oklahoma City does the bulk of the jobbing business in the entire state.

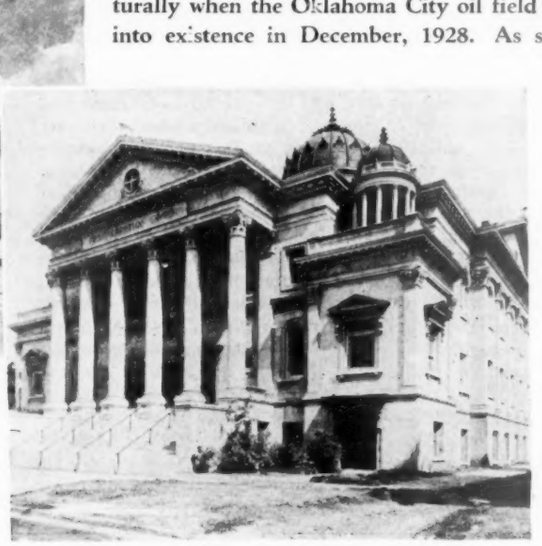
During the past ten years, while the population has been growing from 91,295 to 182,845 . . . an increase of 100.2% . . . $113,455,219.00 have been spent in new buildings in the city.

A large part of this building program has been confined to the residential areas, where the city's newcomers are able to find ideal homes for their families. Oklahome City prides itself on being a true city of homes and home-folk. It has a $6,000,000.00 water works system . . . dependable, economical, electric power from central power stations, also an abundance of natural gas . . . 54 public and 35 private and parochial schools . . . 118 churches . . . 2300 acres of public parks and playgrounds . . . 6 national and one state bank . . . and is growing at the rate of 2500 people each month!

When you come to Oklahoma City you come to a Capitol City in the truest sense. Nowhere else will you be able to find contact with the life of the entire population of a great state in the intimate, complete sense that you will find here.

The fine spirit of co-operation and friendliness which has been for years typical of Oklahoma City in all lines of business followed naturally when the Oklahoma City oil field sprang into existence in December, 1928. As soon as





Upper left—State Capitol Building.

Upper right—One of Oklahoma City's many beautiful Churches on Robinson Avenue.

the magnitude of the field became apparent, operators in the field, and business men through their Chamber of Commerce joined forces and appeared before the State Corporation Commission and asked for a proration program for the field . . . establishing Oklahoma City as the only major field that has not broken the oil market by unrestricted production.

You'll like the way they do business in Oklahoma City and you'll like the advantages it offers. It is from seven to twenty-four hours quicker to all of the major pools in the Mid-Continent area and is the only shipping point from which any point in the Mid-Continent may be reached overnight by rail.

Air, rail and bus lines spider-web the entire area with Oklahoma City as the center.

Many firms have solved their shipping and service problems completely by centralizing their operations and by making that central point Oklahoma City. There is also a plentiful supply of both common and skilled labor.

If you are interested in more detailed information about Oklahoma City and its relation to the entire Mid-Continent Area, write the Oklahoma City Chamber of Commerce. We have arranged to supply you with complete information.

Upper left—New Bank and Office Building.
Center—Oklahoma Club Building.
Upper right—New Oklahoma-Biltmore Hotel.
Lower—Banking District Downtown.

OKLAHOMA CITY
CHAMBER OF COMMERCE
OKLAHOMA CITY, OKLAHOMA

Louisiana--Arkansas Field Notes

Completion of Wildcat Well in Miller County, Arkansas Appears Certain

SHREVEPORT.—The rankest wildcat well since the Homer discovery appears in Lenz and others' Johnson 1, in Section 24-15-26, Miller County, Arkansas, 20 miles east of Texarkana. Bailed for 15 hours fluid, mostly 27 gravity oil, was lowered to 50 feet off bottom and after standing over night had risen to 250 feet of the surface and the next morning was slopping over connections. Total depth is 2847 feet in four feet of a red beds sand body. Of probably 50 wells drilled in Southwest Arkansas during the last several years, this with one exception, is the first to offer any promise of success and the first of the eight drilled by Lenz and his associates.

It has attracted considerable attention and probably will be followed by more or less activity on the part of independents. Royalty trading has already shown some activity and there is some leasing, Lenz, who already had 12,000 acres, is reported to be adding to his holdings.

Nicholls et al's McDermott 1, Section 28-18-6, Bienville Parish, which had a show of oil at 2358 feet, is still waiting for a string of six-inch to be set for a test. Drill stem test last week resulted in one fourble of mud with 10 feet of 35 gravity oil at the bottom, which showing has been followed by considerable lease and royalty trading with at least two drilling blocks reported being formed. In Caddo Parish, R. W. Norton bailed dry again on his Hill 1, Section 33-23-16, at 5400 feet. Triangle Drilling Company has locations for two new wildcats, one in Bossier and the other in its Sugar Creek gas area of Claiborne Parish. The Bossier well is under way on the Bollinger Lumber Company's land in Section 36-23-13, six miles west of Cartersville production and will go at least 3500 feet. Several of the major companies have had leases in the area for some time and are aiding Triangle Drilling Company on the project; and in the event production is developed the properties probably will be developed on the unit plan. Triangle Drilling Company's Sugar Creek well has rig up for Hodges et al's 1, in Section 6-19-15, and is to be another 4500-foot hole for the deep Trinity gas found by two previous such tests.

Get Gasser in Mississippi

Mississippi continued in the spotlight by virtue of Pearl River Oil & Gas Company's Marter 1, in Section 12-5-1e, Rankin County, which is estimated good for 15,000,000 feet of gas with considerable sulphur water from a total depth of 2478 feet. Three other wells in this area—the Jackson gas field—have pay string cemented and are due for testing during the current week or early next week.

R. L. Gay's Bowman-Hicks 8, Section 18-7-13, Sabine Parish, a mile east of the Blue Lake production, is bailing for a test at 2552 feet after oil rose 1500 feet in the hole from 2494 feet and appears to be a definite extension of Blue Lake east, toward production in the Zwolle field proper. Magnolia Petroleum Company has rig up for its Giauque 1, Section 26-7-14, south of Blue Lake, which will be its first test in the Zwolle district.

Loring Oil Company's deep test in Section 21-6-13, several miles south of Blue Lake, Peavy-Wilson 1, was coring at 4365 feet. On the heels of its semi-wildcat producer in Section 27-8-12, a mile north of the Zwolle discovery well, Loring Oil Company's Bowman-Hicks 1, a half mile west of the discovery, was completed flowing 2000 barrels through a 1/32-inch choke from 2382 feet. Both these wells are offset by small pumpers from approximately the same depth—about 300 feet shallower than Zwolle average depth.

Teteco Oil Corporation's wildcat in Section 8-6-12, eight miles south of Zwolle production, which staged a blowout two weeks ago that looked like a commercial well at around 2500 feet, is junked and abandoned at 4077 feet. Frank Melat and others' Schryver 1, in Section 35-14-13, has 150 feet of oil in the hole, total depth 2817 feet, and is waiting on standard rig to become the second producer in the Holly district, outside of Section 5-13-13, the discovery section, in which there are four producers. Location is approximately 2½ miles east of the discovery well.

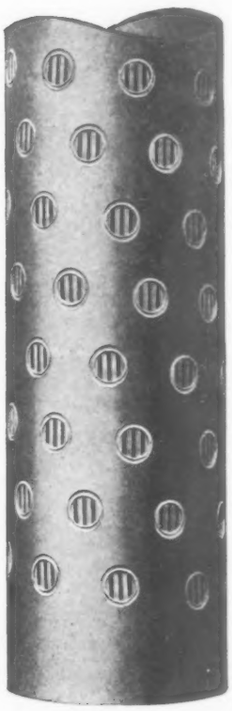
Davis and others have abandoned their Moore 1, in Section 12-11-6e, Franklin Parish, as a dry hole. Tidal Oil Company tested salt water at 2549 feet on its Arkansas Timber Company 1, in Section 3-16-14, Calhoun County, and J. G. Marcum et al's McCurry 1, Section 10-19-4, Ashley County, got it at 3555 feet and is plugging back for another test at around 3467 feet. S. R. Henderson has made location on a block of approximately 6000 acres for his Tilyou 1, in Section 26-8-24, Pike County, Arkansas, where Tri-States Oil & Gas Company recently abandoned its Ruth Wilson 1, in Section 25-5-26, carried for several months as fishing for tools, total depth 700 feet.

Work Starts On Ajax Pipe Line At Five Separate Points

Tulsa, Oklahoma.—Construction crews have began operating at five separate points along the route of Ajax Pipe Line Company's double 10-inch trunk line, which is to extend from the Glenn pool district, near Tulsa, to Wood River, Illinois, a distance of about 400 miles. Crews are now working near Jenks, Broken Arrow and Afton, Oklahoma, and Seneca and Lebanon, Missouri. About 20 miles of the line has been welded out of Jenks, and a like amount in a southwesterly direction from Seneca. Most of the pipe has been strung for the Oklahoma section of the carrier. Oklahoma Contracting Company, Dallas, has the entire contract for building the line, with C. A. Mulligan, superintendent in charge of the crews, while the Austin Company recently was given contract to erect nine main-line stations.

The pipe joints are being welded with acetylene gas. The line will be insulated with a hot asphalt coating and paper wrapped.

NEW IMPROVED McEVOY STRAINER



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A NEW PROCESS, which has been under development by McEvoy engineers for several years, has recently been made standard practice in the McEvoy Factory.

This process results in improvements that are astounding in spite of the fact that the previous McEvoy Screen had never been excelled.

Those who have seen and are using the NEW IMPROVED McEVOY STRAINER with case hardened steel or brass strainer plugs, have been impressed with its new features. It is a true example of the work of McEvoy engineers who are constantly experimenting in advance of present methods and requirements. Their recent creation, the NEW IMPROVED McEVOY STRAINER is a clear step forward in making a good strainer better.

* * *

Make a special effort to see the NEW IMPROVED McEVOY STRAINER or send for NEW CATALOG.

McEVOY UNIVERSAL HEAD

Stands Pressure — No Gas Leaks

It is a serious matter to have gas leaks. Use the McEVOY UNIVERSAL HEAD that is used so successfully in the Refugio Field and other fields where the pressure is terrific. The McEvoy Universal Head prevents leaks and stands the pressure.

When used as a drilling control head with main body mounted in casing and with Automatic Safety Pressure Head Attachment close at hand, you need have little fear of the fury of gas pressure.

The drill stem can be raised to the nearest coupling or tool joint below the head, and the Automatic Safety Pressure Head dropped into place. It locks itself at once. The weight of the drill stem resting on it makes a pressure tight joint.

While seated in the spider, pump pressure may be applied to hold down gas pressure. After pressure subsides, the safety pressure attachment may be quickly removed and drilling resumed. The Automatic Safety Pressure Head may be used at any time during the drilling to force the mud into any loose sand or caving strata.

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News From Rocky Mountain Fields

New Northern Montana Gas Project Planned

Great Falls, Montana.—Northwest States Utilities Company, subsidiary of Minnesota Northern Power Company of Minneapolis, practically controls five natural gas systems operating in Montana, and it is now reported that one of its subsidiary companies plans the development of a new northern Montana project. The Minnesota Northern Power Company through its various subsidiary companies serves 110 towns in Montana and the western parts of North Dakota and South Dakota; it is installing systems in the Wyoming towns, Buffalo and Sheridan. Recently the company assumed control of Montana Cities Gas Company, Northern Natural Gas Development Company, Central Montana Utilities Company, Havre Natural Gas Company, and Pondera Utilities Company.

The line which was laid from the Cabin Creek field, southeastern Montana, to Williston, N.D., has been completed by Hope Engineering Company, and the line to Bismark and Mandan will be completed by September 1. At present, equipment for an extension from a point near Telstad to the Canadian line is being shipped; it will carry gas from the Sweetgrass Hills fields and the Rogers-Imperial well in Canada.

Start Gas Pipe Line

Casper.—A pipe line to transport natural gas from the Billy Creek field, in Johnson County, Wyoming, to the northern Wyoming towns of Buffalo and Sheridan has been started by Hope Engineering Company. The line is to be 55 miles long and will consist of eight-inch welded pipe. Hope Engineering Company is to install the distributing system in Buffalo and will lay additional piping in Sheridan, where there has been an artificial gas system.

Mule Creek Deep Test

Lusk, Wyoming.—Another deep test well in Wyoming is giving indications of interesting outcome in lower horizons. It is Argo Oil Company's deep well in the heart of the Mule Creek field, northeastern Wyoming, which has 500,000 cu. feet of gas at 2864 feet. The gas is non-inflammable and may contain helium. It is similar to that discovered in the Minnelusa formation in southwestern South Dakota.

Seeks Lusk Gas Franchise

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Buys Dallas Dome Acreage

Lander, Wyoming—A 1000-acre block of potential oil-producing land north of the Dallas Dome field has recently been taken over from Burnside Oil Company of Somerset, Pennsylvania, by the Atlantic-Pacific Oil Company, a newly organized Wyoming corporation which is subsidiary to the Mexican Seaboard. The company bought Dallas Dome Wyoming Oil Fields Company's holdings in the Dallas and Derby districts not long ago, and plans an intensive campaign in this part of Wyoming. The company is at present repairing and cleaning out all old wells in the field which are producing, and is plugging others which are considered of little or no value. Extensive improvements are being made at camp, which is one of the most picturesquely located in all Wyoming.

Barthelote Dome Well

Great Falls, Montana.—The discovery well on Barthelote dome produced 60 barrels in a few hours swabbing test last week. Oil is high gravity, comes from a sand 85 feet thick, with total depth 2435 feet. The structure is in the northern part of Toole County, northwestern Montana, and was tested about two years ago by Prairie Oil & Gas Company, which abandoned its well.

Test Pendroy Structure

Conrad, Montana.—An interesting wildcat well has been spudded in on the Pendroy structure, southwest of this town, by Midwest Refining Company. This structure, it is believed by geologists, may develop similarly to the Pondera field and the Midwest Refining Company well will do much to prove or disprove the theory.

Milk River Test

Cut Bank, Montana.—Fulton Petroleum Company is at last able to move in material and equipment for the wildcat well to be drilled on Milk River anticline, Blackfeet Indian reservation, not far from Glacier National Park. This well has been located for months past, but is in remote territory inaccessible most of the year to trucks.

Oil In Byron Gas Field

Byron, Wyoming.—Ohio Oil Company has discovered a production of 500 barrels per day in the Byron gas field in the Tensleep sand. Crude is black and has gravity of 26 degrees. Total depth is 5414 feet. The well is to be pumped until available storage is filled and will then be shut in. This is the first well in this field to be drilled to this deep horizon, the district previously having been proved for gas only.

Deepen Garland Well

Garland, Wyoming.—Ohio Oil Company has a flow of 58,000,000 cubic feet of gas in its deep test on Garland structure, at 3887 feet in the top of the Madison lime. Company will kill the gas and drill deeper.

Osage Lease Sold

Osage, Wyoming.—A 160-acre lease in the western extension of the Osage field was sold by James McCullough to Wyotex Oil Company of Portland, Oregon, for $115,000. This lease has one producing well which is pumping 100 barrels.

New California Wells

Los Angeles.—Twenty-two new wells were started in California during week ended July 19, compared with 18 the previous week. Of the new wells started, seven were at Long Beach, five at Playa del Rey, two at Potrero, one at Huntington Beach, one at Rincon, with the rest scattered over the state. Two were wildcats.

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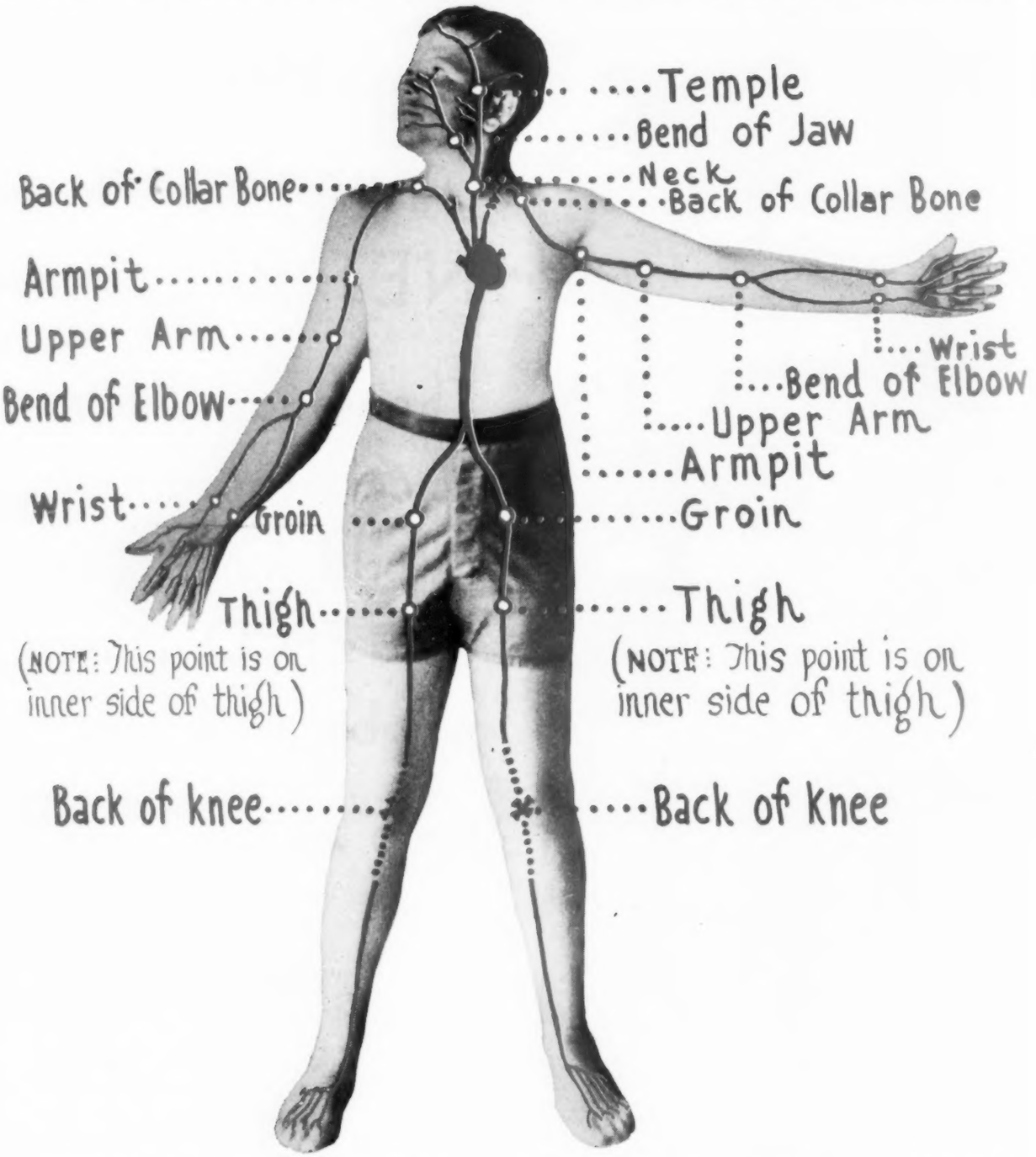
(This advertisement was run in this issue of The OIL WEEKLY *last year. Th*

Course of Arteries and Pressure Points



Arterial bleeding can be controlled by applying pressure at any point shown which is between the wound and the heart. Pressure may be applied with fingers, tourniquet, compress or constricting bands such as handkerchief, belt, strap, etc. DO NOT use wire, rope or cord. Pressure must be released for a few seconds, every twenty minutes, to prevent gangrene.

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response from it was so widespread that we are repeating it again this year.)

No. 1—Starting position

No. 2—Beginning of Exhalation

No. 3—Completion of Exhalation.

Cuts 2, 3, 4 and 5 show the respiration cycle. This should be completed at the rate of fifteen times per minute. Apply sufficient pressure in position number 3 to expell the air from the lungs by compressing the chest cavity.

No. 4—Beginning of Inhalation

No. 5—Completion of Inhalation

The Mid-Continent Petroleum First Aid Contest, the first of which was held in 1925, has become one of the outstanding events of the International Petroleum Exposition. Each year has shown an increasing interest in the contest, based on the yearly improvement in the contest itself, the constantly increasing activity in First Aid Work, and the growing recognition of the true value of First Aid Training to the industry. We approach the Annual Contest with more than seventeen thousand trained first aid men in the Mid-Continent Oil territory and over three hundred living examples of the effectiveness of the work —men who today would be in their graves were it not for the trained ability of their fellow workers. Certainly, this is ample compensation to all those companies and individuals who have labored so effectively to establish Safety and First Aid work as an integral part of the Petroleum Industry.

Issued by

Safety Section

Mid-Continent Oil & Gas Association

Tulsa, Oklahoma

Attempt to Cut Texas Back 125,000 Barrels
(Continued from page 197)

50 per cent; Chapman field to be held at 7000 barrels; Refugio to be cut one-third; Pettus to be restricted to 6200 barrels daily; Barbers Hill, Humble, Sugar Land and Raccoon Bend received special consideration by commission as these areas are only flowing production in the Gulf Coast and could undoubtedly stand a reduction of at least 21,000 barrels daily.

"Should any new pool be brought in during this proration period, or any extension thereof, as the result of drilling in progress at the effective date of the commission's order, or as the result of drilling done pursuant to a contract in existence as of such effective date, then the production from such new pool shall be limited to such an amount as the commission upon hearing shall then determine.

"5. That new wells in old pools drilled after the effective date of your order be divided into two classes, A. wells, the drilling of which was made necessary to protect the lease premises on which same were drilled from offset drainage and or forfeiture; B, all other new wells in old pools; that the production from Class A new wells be run in with production from the lease on which same are respectively situated, and be figured in arriving at the average daily production per well per lease; that the production from Class B new wells be shut in and not produced during the proration period, or any extension thereof, except in such manner as the commission may after proper hearing allow."

From North Texas Chapter of A. P. I. Division of Production

Wichita Falls, Texas.—Production superintendents and petroleum engineers representing the leading producing units in North Texas assembled here July 24 and formed a local chapter of the American Petroleum Institute division of production. Frank M. Stauffer, petroleum engineer for Panhandle Refining Company, was elected chairman of the newly created chapter, which becomes a part of the Southwestern district. North Texas affords an exceptionally fertile field for a chapter due to the large membership available, and varied assortment of oil producing conditions.

Brief talks outlining the purposes and advantages to be had in maintaining local chapters were made by the following speakers: Carl A. Young, executive secretary of the Division of Production; J. R. McWilliams, production engineer Skelly Oil Company, Tulsa; and E. Stanley Durward, petroleum engineer, Shell Petroleum Corporation, Dallas.

Other officers chosen by the North Texas chapter included the following: L. D. Ryan, vice-chairman, and C. B. Clement, The Texas Company, secretary-treasurer. The advisory committee consists of the following: W. K. Campbell, R. P. Brotherton, Joe Cable, W. B. Nicholson and R. H. Washburn.

Chapman Completions Raise Daily Output to New High Level

Houston.—Relief planned for the Williamson County pool in the Chapman district by the construction of two refineries and additional pipe lines will be very timely with completions and initial production increasing the daily output. The completion last week of Earl R. Marts, T. P. Simmon 3, marked the largest well that has yet been brought in for the Chapman district. The well came in very unexpectedly while the drilling crew was working on something else. It hurriedly cleaned itself and then began flowing into the slush pit through a three-inch pipe and had to be put on a 3/8-inch choke so that pipe line connections could be made in order to take care of the 3500 barrels production.

Stratton and Horn's J. C. Abbott 2 which came in several days ago is still holding its own and is giving an impetus for more drilling in the field. Several wildcats are being started as a result of this and operators are seeking to protect themselves in that area. While these tests are being made in Williamson County, Houston Oil Company is going in for deep tests in Nueces County and is planning on drilling the Brooks 1 to a depth of 6000 or 7000 feet. This is one of the first deep tests for the Agua Dulce field and is proving very interesting for all operators in that particular territory since the well is already at a depth of over 5000 feet.

Bids Asked for New Line in Mexico

Mexico City.—Leading pipe line contracting firms in the United States have been requested to submit bids for construction work on a 142-mile 10-inch welded crude oil line to be built by Cia. Mexicana de Petroleo, or "El Aguila," which is a member of the Royal Dutch Shell group. Request for bids have beeen sent out by L. Szily, construction engineer, who now maintains headquarters for the above Mexican subsidiary at Avenida Juarez No. 92, Mexico City, D. F., Mexico, for the laying of the line from Palma Sola, located near Vera Cruz to Mexico City. Bids are to be opened in the latter city on August 1.

The proposed crude line will extend in a southwesterly direction from Vera Cruz and over steep mountain ranges in reaching Mexico City. It will supply crude for the refinery project of the Royal Dutch Shell group in the latter city. No details have been given as to the number of main line stations to be installed, although the number will be more than usual because of the steep grades to be climbed in rising from sea-level elevation at Palma Sola to an approximate 7500-foot elevation at Mexico City.

Pipe line contractors are to bid on unloading, stringing, welding, doping and burying the pipe, as well as to provide the ditch.

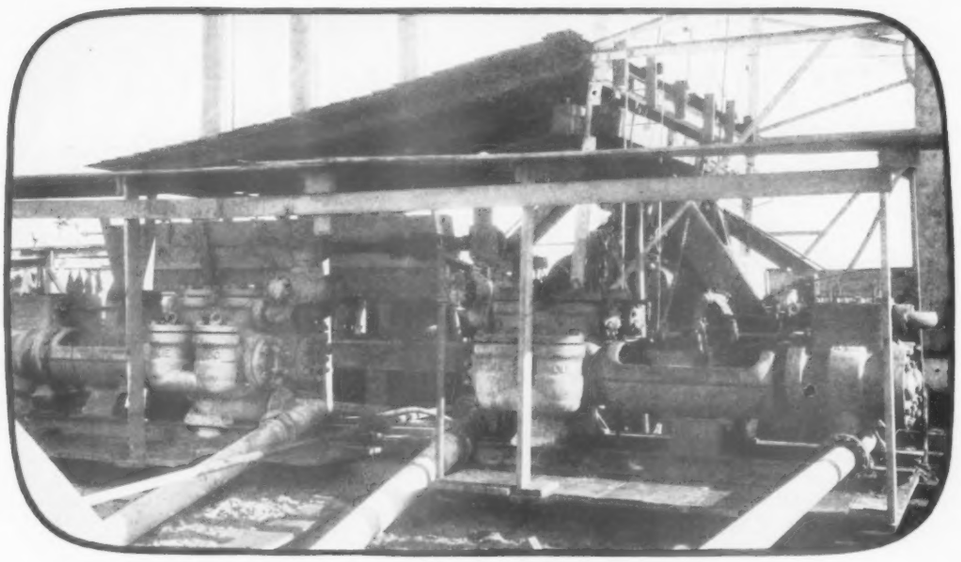
More Leasing in Bastrop County

Houston.—Renewed interest in oil activities and further leasing of land has been experienced in Bastrop County during the past several weeks. This is partially due to very favorable showings of oil that have been encountered in the tests on the Abernathy well in the Cedar Creek community, which is expected to make a real producer upon its initial flow.

Gulf Production Company has had a crew engaged in core drilling in the vicinity of Walnut Creek and it is also expected to begin test wells in various locations west of the river soon.

Phillips Extends Line to Morton-Reeder Pool

Amarillo, Texas.—Extension of Phillips Petroleum Company's pipe line gathering system from western Hutchinson County to the Morton-Reeder pool, located in northern Moore county, will be made to provide crude market outlet for the two completed wells and a trio of drilling tests. This line will consist of about 17 miles of six-inch pipe, and the crude will be consumed at the Borger refinery of Phillips Petroleum Company. A. D. Morton and associates discovered the pool in June, 1927, and the well has reamed shut-in most of the time for lack of a market. Entrance of the pipe line into the pool may result in Shamrock Oil & Gas Company, which has two tests underway, abandoning its plans for the erection of a refinery and tank farm should its production justify such a project.



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Pumping Research In California

By BRUCE H. ROBINSON** and ROBERT R. ROBERTSON*

WITH many wells in deep producing horizons declining in production to the point where they will no longer flow, and with the ever-increasing necessity of keeping lifting costs on pumping wells to an absolute minimum, much attention has been directed toward:

1. The pumping of wells tubed below 5500 feet.

2. Research into methods of determining and controlling the length of plunger stroke.

3. The attainment of higher volumetric efficiency.

Pumping of Wells Tubed Below 5500 Feet

Pumping of deep wells in California is relatively new, and has presented many interesting features, the most important being that in spite of difficulties successful operation of strings of sucker rods from 5500 to 7000 feet in length is entirely feasible. At least one well is now pumping from below 7100 feet, and many wells are pumping from 5500 to 6500 feet.

Both 2½-inch and two-inch tubing and pumps are used, most of the pumps being of the insert type. As will be shown later, no sacrifice in production is made by using the smaller plungers of the insert type of pump. Some companies are using combination strings of ¾-inch and ⅞-inch rods, but one that is probably pumping more deep wells than any other is using only ¾-inch rods from top to bottom in its wells with pumps below 5500 feet, and to date has had very little rod trouble.

The main problems in pumping from these depths are as follows:

a. To allow for rod stretch or reduce it or its effects on the plunger stroke.

b. Proper counterbalancing.

c. Efficient pumping speed.

d. Reduction of sucker rod stresses.

e. Power and prime mover.

f. Mechanical rig difficulties.

Aside from the last, these are not independent variables, but each must be considered in conjunction with the others. Under a conservative program maximum production is not the controlling factor.

Rod and Tubing Stretch

Several remedies are available for the first problem. Whip out the rod stretch on the downstroke by underbalancing; increase the pumping speed to obtain the lengthening effects of rod and fluid inertia; decrease the fluid load; increase the stroke at the surface; use larger diameter rods. A further remedy might be added as a tentative possibility; changing the kinematics of the beam motion.

Decreasing of fluid load by using smaller size plungers has proven the most successful method, and on slow speed work does not decrease plunger displacement. This is an easy remedy to apply with an insert pump. Though it may seem an anomaly, it proves out in practice and can be shown by figures. Considering the slow pumping speeds necessary, the usual rod and tubing stretch formulae may be used to figure it. As an example, take a 6500-foot well, 2½-inch tubing and ¾-inch rods, average gravity of fluid pumped 35 degrees A.P.I., pumping with a polish rod stroke of 64 inches:

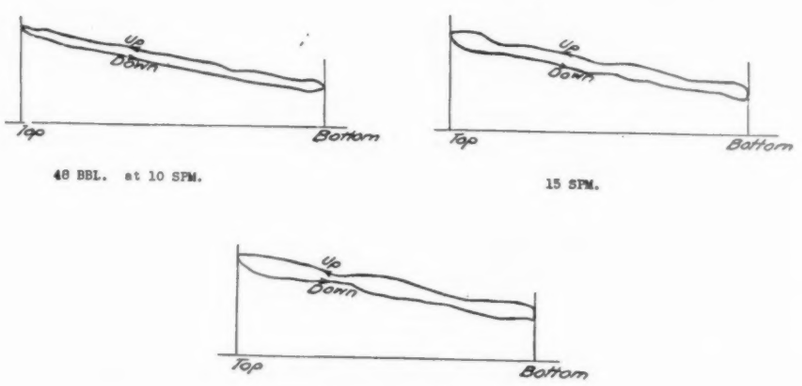
The load of a 2½-inch liner pump would stretch the rods to such an extent that the plunger would not travel. With a 2½-inch insert pump, 1 15/16-inch eff. diameter the theor. stretch would amount to 52.7 inches, leaving a plunger stroke of only 11.3 inches at 12 s.p.m. the displacement would be 59.3 barrels daily. In the same manner the two-inch insert pump, 1 7/16-inch effective diameter, would only cause 29.2 inches of stretch, leaving 34.8-inch plunger stroke, and at the same pumping speed would give 100 barrels a day displacement.

Figure 1 illustrates to what extent rod stretch must be taken into consideration in determining the proper speed to get the required plunger stroke.

The cards are not as sharp ended as are obtained at still lower speeds. Approximate computations of the plunger stroke may be obtained by using the usual stretch formula, but the taking of successive cards and comparison with production data is necessary to accurately arrive at maximum production.

Need Larger Prime Mover

Underbalancing necessitates a larger prime mover, decreases power efficiency, increases rod and belt or gear stresses, and adds to the dangers of hitting fluid. It is particularly unpractical on motor drive. A speed increase has much the same effects as underbalancing, but in



48 BBL. at 10 SPM.

15 SPM.

86 BBL. at 12.75 SPM.

4406 FT. 2½ in. Liner pump, 2½ in. tubing, 3/4 rods. Stroke , 3rd hole. at 15½ strokes, this well made 114 bbl.

CHANGING TO 4th HOLE AND 12.4 SPM GAVE 115 bbl. WITH 132 BBL. COMPUTED DISPLACEMENT.

FIGURE 1

**Assistant Production Engineer, General Petroleum Corporation. *Consulting Engineer, Marton-Decker Corporation.

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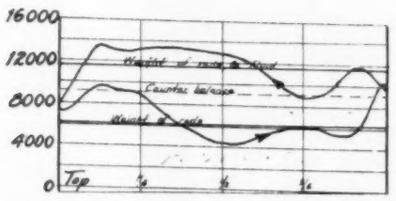
16.5 spm. 47 inches

18 spm. 47 inches



22 spm.
39 inches

STROKE in.	SPEED spm.	COUNTERBALANCE calculated rods + ½ oil	from card	on well	%	DISPLACEMENT based on pol. rod stroke bbl/day	PRODUCTION bbl/day	VOL.EFF.
47	16.5	8832	9350	6615	70.8	338	191	56.5
47	18	8832	9490	9055	95.3	368	230	62.5
39	22	8832	9180	8445	91.9	370	242	65.3

FIGURE 2

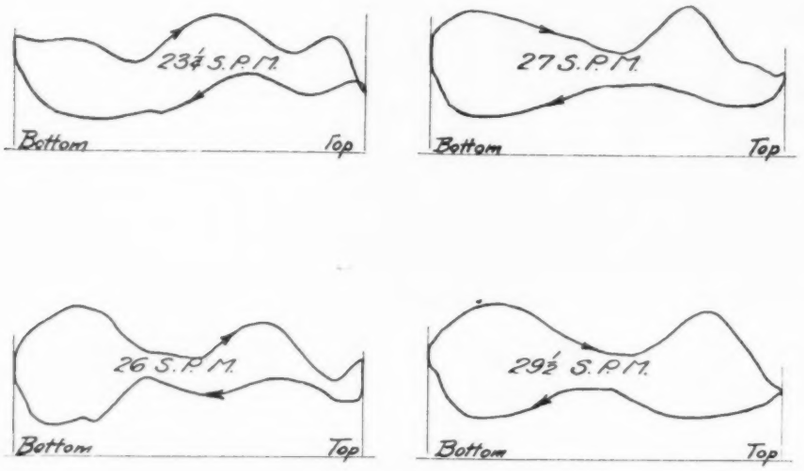
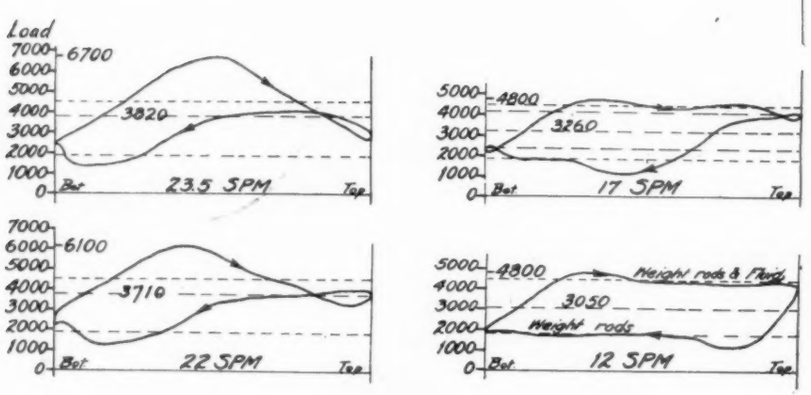


FIGURE 3



HITTING FLUID AND A LOOSE RIG CAUSE EXCESSIVE LOADS AND LOW EFFICIENCY

FIGURE 4

general better results are obtained by the latter. But speeds much above 20 strokes per minute are practically out of the question on these deep wells on account of the high stresses induced in the rods by acceleration or inertia forces. Proper balancing, together with the correct proportioning of speed and stroke has a great deal to do with the attainment of a smooth rod action, a good plunger stroke, and lowest lifting cost.

The cards shown in Figure 2, though from a well tubed but to 4250 feet, are very illustrative of this point of balance, speed and stroke. A very irregular rod load running well over 14,000 pounds maximum at 16.5-47 inch strokes per minute, changed to a smooth load condition with a maximum of 13,000 pounds at 22-39 inch strokes per minute. Simultaneously a gain in production of 26.7 per cent was made with an increase in horsepower load at the polished rod of but 16.7 per cent.

The deeper the well, the more these conditions are emphasized, in their effect on the plunger motion. Shock loads in the deep wells, due to picking up the fluid load may be absorbed by the greater flexibility of the string, but an irregular motion may be very disastrous. Hitting fluid is a different type of shock load which increases in its bad effects the deeper the well.

A comparison of the tables at the bottom shows that operation of the well at the shorter stroke at higher speed and within 10 per cent of the correct balance resulted in a higher production, and from the volumetric efficiency based on polished rod stroke, a longer plunger stroke for the same rod stroke.

Counterbalancing

Proper counterbalancing is only a mechanical problem, if we consider "proper" as meaning bringing the balance up to that indicated by the dynamometer card. In the deep well, especially when electrically pumped, balancing for minimum power is almost a necessity on account of lifting cost and the size of prime mover and pumping gear. Rotary balances are used almost to the exclusion of other types, and crank balances are in the majority in order to keep crankshaft stresses low and have sufficient effective weight. The long strokes necessary for relatively slow speed pumping in these deep wells necessitates a very heavy counterbalance as naturally the mechanical advantage of the balance over the crank arm is low. Theoretical counterbalance force in some cases is greater than attainable with standard equipment, even with ¾ rod strings in use, and requires a well braced rigid rig to handle. To get the necessary weight on the crank balance, one company is using weights cast of lead in place of the usual cast iron.

Efficient Pumping Speed

By the most efficient speed is meant

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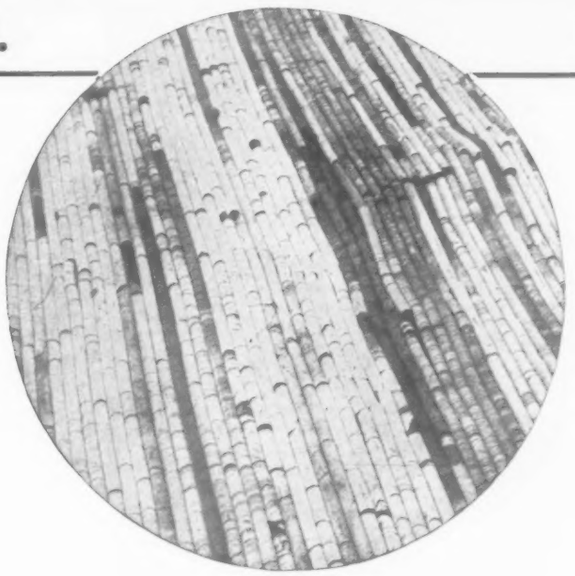

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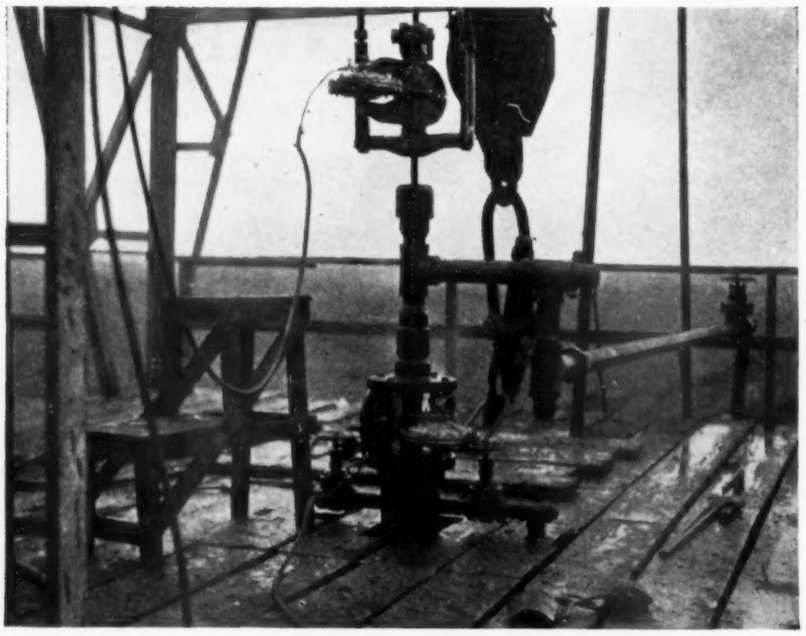


FIGURE 5

that which is best adapted to all other factors. A good rod motion, free from excessive vibrations; low rod stresses; a plunger stroke sufficient to keep up production; and one which will give good power economy and not overload the pumping mechanism nor prime mover in either average or peak loads. This can only be determined by inspection of the card and meter readings.

These four cards, Figure 3, from a steam engine driven pumping well, having a three-inch insert pump, inverted type, pumping approximately 400 barrels a day, mostly water, at 4470 feet. This well has a concrete block balance between the jack and Samson-post, weighing approximately 6200 pounds, together with eight pairs of auxiliary weights on the band wheel balance giving a total effective balance at the rods of 9750 pounds, which is about 1500 pounds under the theoretical weight. The maximum load indicated is about 17,400 pounds at the counterbalance peak in the middle of the up-stroke. During the 29½ stroke card, the concrete block suspension was actually leaving the beam at the end of the down stroke. Operation of dead weight balances at such a speed is apparently not feasible.

Of particular interest is the change in the type of card between the 23¼ stroke and 27 stroke cards, at 26 strokes per minute. A speed around 26 for this well would be a very poor operating speed. Maximum load at 27 strokes per minute is on the counterbalance peak and the maximum at 29½ strokes per minute is on the load pick up.

Reduction of Sucker Rod Stresses

Reduced rod stresses may result from a proper regulation of the other factors, if the dead loads are not too high. Heavy stresses due to the rod weight alone can only be remedied by the use of higher tensile and endurance limit rods, or the use of combination strings.

Power and Prime Movers

As to prime movers, economy must govern. Steam gives a smoother load card in deep wells, and the difference is more noticeable under severe conditions. A smooth card will result with steam engine drive even with the well badly underbalanced, but pumping with steam often cannot compete with the motor or gas engine in lifting cost. The smoother card is due to the tendency of the engine to slow down as the loads increase while a motor or gas engine tends to maintain its speed regardless of the load. Proper regulation of the other factors allows motor pumping on even the deepest wells; 25/65 motors are coming into use and are more suitable for these deep wells than 20/50 motors which are often considerably overloaded and even the 25/65's are pulling upwards of 30 horsepower even in well balanced wells. Even larger motors would be required if the wells were underbalanced to gain increased plunger strokes.

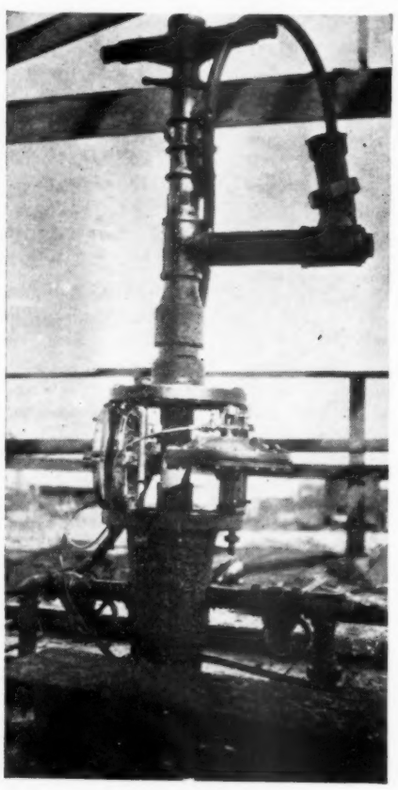


FIGURE 6

Mechanical Difficulties

Rigs must be braced to withstand these heavy pumping stresses. Looseness creates excessive rod vibrations. Stresses created by the heavy balances required must likewise be counteracted by rigid jack-posts and foundations. Saddle bearings of bronze are often required. Beams must be solid and hangers sufficiently strong. Snug wrist pin bearing in the crank and in pitman made for a minimum of trouble, as these must transmit the force from the counterbalance as well as from the prime mover.

The cards in Figure 4, though from a shallow well, show what effects rig looseness can have. Looseness to this extent could not be tolerated on one of the deeper wells but looseness does exist, especially with wooden rigs and does create excessive rod loads. In a recent instance, a concrete foundation and jack-post mounting showed a large increase in pumping efficiencies over the same rig, prior to the change.

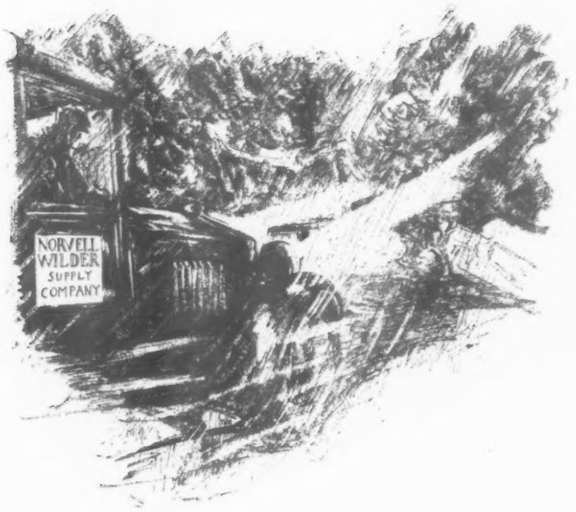
Kinematics of Beam Motion

Experiments have been conducted toward changing the type of motion but these have not yet been applied to these deep wells, nor with the object of compensating for rod stretch. Cam driven pumps, and counter-clockwise rotation of the standard rig crankshaft might be considered under this head.

Plunger Stroke

The problem of the plunger stroke for a given rod stroke at various speeds above the lower limit is something which is hard to predetermine. Certain tests have led to us to believe there are possibilities of obtaining this stroke with more certainty from dynamometer cards than given by any heretofore published method. The tests are yet incomplete and the results have not yet been proven of universal application. Enough has been done, however, to draw certain conclusions.

At higher speeds the time required for stress transfer from the bottom of the



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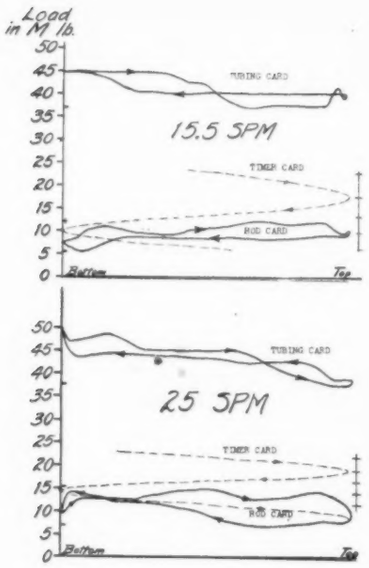


FIGURE 7

rods to the top is a material factor and becomes of more importance than the higher speed. In other words, it is the average of the stresses in the rods that must be used to compute the stretch. Stress waves travel at the speed of sound —17,200 feet per second in steel. In a 4300-foot well that will mean a quarter second phase difference between loads at the polish rod and those at the plunger, or at 20 strokes per minute, with uniform crank velocity, 30 degrees of crank revolution. During such an angle of crank movement actual cards show large variations in load. Comparison of scratched pump barrels has shown remarkably close correlation with the stretch computed by using the average loads effective in the rods and tubing (computed separately) at any instant. The method of taking tubing loads is interesting and will be described.

Three diaphragm units were used in taking the tubing cards as shown in Figure 5. One was used on the polished rod and connected to one connection of the indicator in the usual manner. Two were used between the flanges of the tubing head, which were connected to each other and through a tee to the other indicator connection. The needle valves on the diaphragms and indicator connections made it possible to take cards from any unit separately.

The units between the flanges were centered as closely as possible by measurement and then checked by taking dead load cards on each one separately.

Figure 6 shows a closeup of the tubing diaphragm units. Long tubing head bolts were used and the levers of the unit set straddle the bolts in the same manner as they would be on the polished rod.

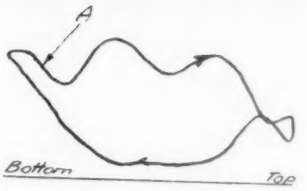
This photograph shows also how the tubing was filled with water to give a starting load with a known weight of liquid in the tubing from which calculations could be made based upon a dead column practically free from gas.

Tubing and rod cards in Figure 7 are from a well in which the pump is set at approximately 5600 feet, using ¾ rods, 2½-inch upset tubing and 2½ insert type pump. Cards were taken at a stroke of 42¾-inches at the polished rod. The phase relation between the time the load is picked up by the rods and the time before it goes off at the tubing is of interest and emphasizes the need for this time factor consideration in all plunger stroke computations at higher speeds.

A detailed analysis of these results could not be given as yet but certain conclusions may be drawn.

These tests showed that the movement of the tubing may be much greater than is occasioned by mere removal of the dead load. Apparently the working valve did not close until after the whip, as the load did not go off the tubing. Hitting fluid causes the tubing to vibrate quite extensively and rod whip caused by underbalancing is not an actual gain in a large number of cases.

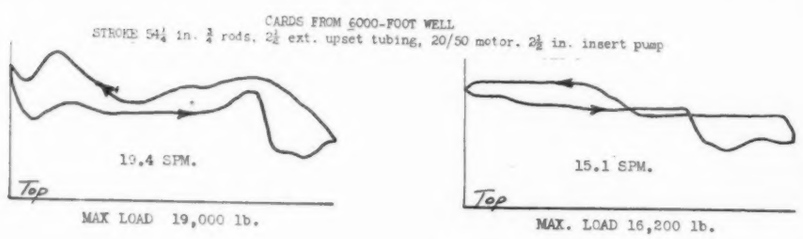
Figure 8 is shown simply as an illustration of an indication of a rod whip which apparently does not give the working valve time to close. Where the up and down stroke lines follow each other closely (as in A) this condition seems to exist.

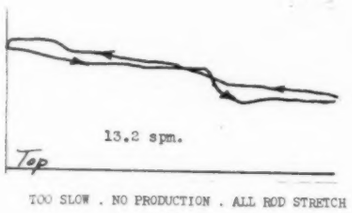


CARD SHOWING EXCESSIVE ROD WHIP

Tubing is following plunger during initial portion of up-stroke.

FIGURE 8


CARDS FROM 6000-FOOT WELL
STROKE 54¼ in. ¾ rods, 2½ ext. upset tubing, 20/50 motor. 2½ in. insert pump
19.4 SPM.
Top
MAX LOAD 19,000 lb.
15.1 SPM.
Top
MAX. LOAD 16,200 lb.



TOO SLOW . NO PRODUCTION . ALL ROD STRETCH

FIGURE 9

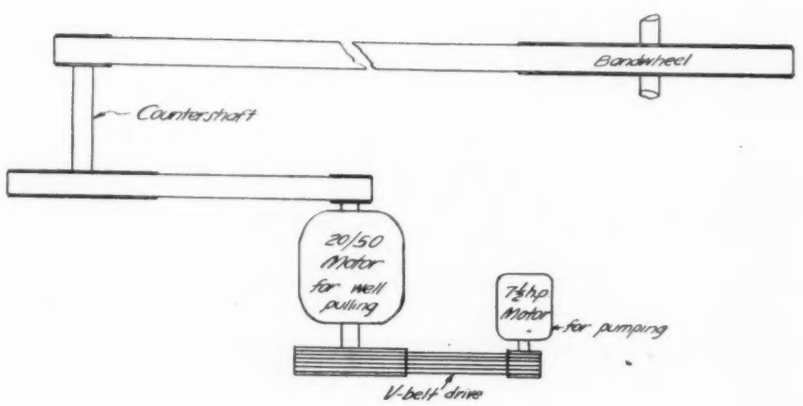
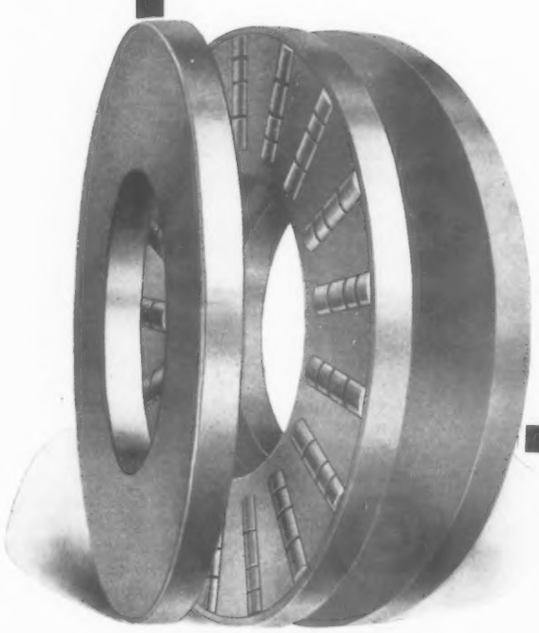


FIGURE 10

High Volumetric Efficiency

Excessive pump displacement results in

Hard-- Tough-- Sturdy-- Enduring--



The adjectives fairly describe Rollway Thrust Bearings. Fundamentally they are made of the highest grade bearing alloy known. Rollway exacts from this steel its greatest performance by a *thorough* heat treatment. Plates and rollers are hardened throughout — no danger of soft spots after grinding, or of cracking or spalling due to a thin case — and both are accurately ground to close limits. Loads *vertical* to the axes of the rollers have no force component tending to displace them and form the relation giving maximum thrust capacity.

These Rollway Thrust Bearings, together with Rollway Radial Bearings, are specified by a constantly increasing number of engineers— as their performance demands an increasing confidence.

Pacific Coast Distributors—

Jos. A. Masterson & Co., Los Angeles, California.
Irvin Silverberg & Co., San Francisco, California.

ROLLWAY BEARING COMPANY INCORPORATED

SYRACUSE NEW YORK

ROLLWAY CYLINDRICAL ROLLER BEARINGS

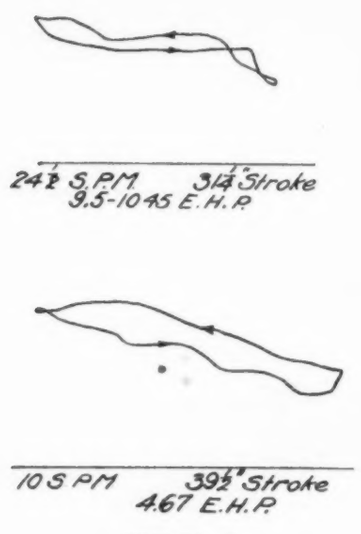
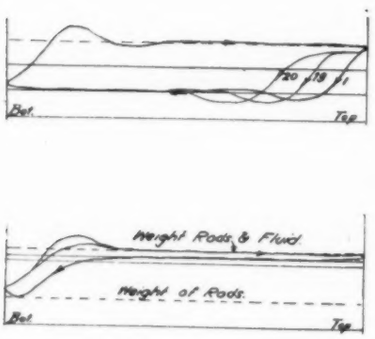


FIGURE 11



SUCCESSIVE CARDS FROM A WELL PUMPING DOWN ITS FLUID LEVEL at 10 SPM.

FIGURE 12

the plunger hitting fluid on the downstroke. The deeper the well the worse are the rod conditions produced. An excess load of 3000 pounds is indicated in Figure 9. In this connection it might be well to mention that delayed load pickup so often noticed on dynamometer cards appears to be due to the vibration and following of the tubing subsequent to the hitting of fluid. The rods sometimes do not take the load until almost the middle of the upstroke. Hitting fluid is an indication of excess displacement, gas trouble, or both, and suggests reduction in pumping speed and use of a good gas anchor.

Figure 9 indicates the effects of hitting fluid on a deep pumping well. It likewise shows the difficulties encountered when the elimination of excess speed to attain high volumetric efficiency is attempted. An entire change of conditions, decrease in plunger size, a lengthening of the stroke, may be necessary to correct such a condition.

The regulation of pumping displacement to the amount of fluid that the well will make has resulted in large savings for many California leases. Wells making less than 150 barrels of fluid daily are candidates for the "slow motion" class. By slow motion is meant 12 strokes per minute, or less.

Many types of slow motion rigs are being tested, the important requirement being first and maintenance costs. Auxiliary gears and countershafts comprise most of the test units, and speeds used run as low as 0.6 stokes per minute for a 15-barrel well.

One method of pumping at a slow speed is shown in Figure 10. The 20/50 H.P. motor originally on the well and which has served to pump it before production declined was used as a countershaft and fitted with a multiple V-belt pulley of 20-inch diameter and driven by a 7½ H.P. motor. The driving pulley in this case was 5.4 inches, as determined from the estimated displacement. A card later taken showed a higher friction than estimated, so that it was necessary to increase the driving pulley to seven inches in diameter to get the required displacement for the well's production.

In this type of installation the larger motor is available for pulling the well, but pumping is done at the correct speed, at high motor efficiency and at greatly reduced power consumption.

Some Provide for Low Speeds

Some of the newer individual units now being manufactured provide for these low speeds and as a larger number of such wells have old wooden rigs with excessive vibration, these units are coming into rapid use where the production warrants the investment.

Cards from a test of a 50-barrel producer are shown in Figure 11. The same production was obtained at 10 strokes per minute with a 39.5-inch polish rod stroke as was obtained with 24.5-31.25-inch strokes per minute. Power cost was lowered 50 per cent and in addition there was the further saving of reduced maintenance of rig and pumping equipment.

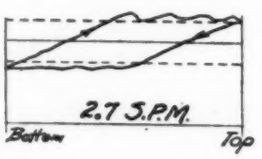
Well tests indicate that with plunger and cup type pumps volumetric efficiencies of 90 per cent can be expected. In actual practice it seems advisable to figure on but about 80 per cent to provide for pump wear and to reduce well pulling.

Figure 12 shows a well pumping at 10 strokes per minute with a three-inch liner pump at 925 feet. The proportionate cut in speed can be approximated by measuring the horizontal distance between the rod stretch lines of card No. 1, at the top and comparing them with the distance between these lines on the lower card, which was taken after the fluid had been pumped down to a constant level.

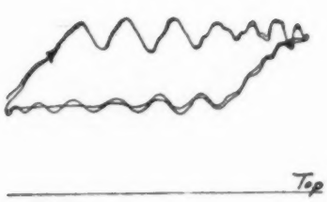
It is interesting to note that on one 12-barrel well when pumped at 28 SPM with the original installation the well required pulling on an average of once every two weeks, but since slowing down to less than three SPM it operated steadily for over six months without trouble and has maintained its production.

The top card in Figure 13 was taken from the well just described, pumping at the speed indicated and giving practically an ideal card. The two lower cards are indicative of slow speed trouble often not apparent at higher speeds. A slight rig looseness caused the first and the second indicates a leakage of some type.

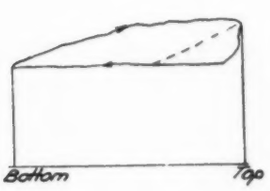
Close study of pumping troubles has resulted in very noticeable reductions in lifting costs. It is significant that the companies which are periodically testing their pumping wells are reducing power requirements and service costs. Many of the deep wells mentioned are being pumped on the beam with surprisingly little rod trouble to date. Properly handled the deep well does not present an insurmountable problem.



IDEAL SLOW SPEED CARD



RIG VIBRATIONS

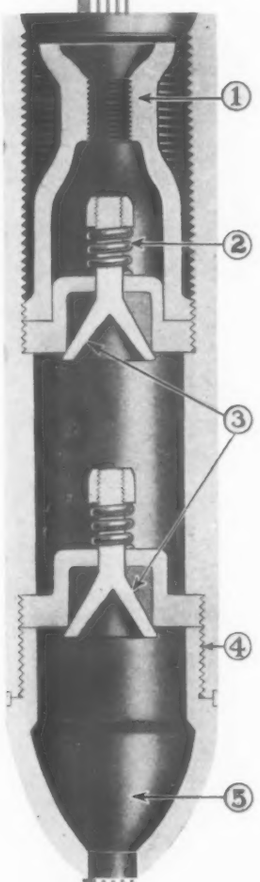


NO PRODUCTION * BY*PASSING PLUNGER OR A BAD TUBING LEAK

FIGURE 13

The STANCLIFF SCREEN

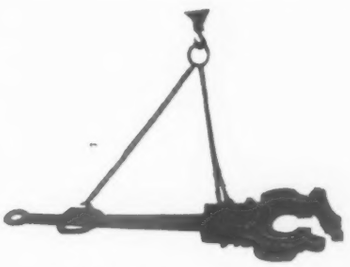
Keeps Its Gauge



In the illustration to the right you will note that the square wires will keep same distance apart when the tops are worn. This is a big advantage over screens where the distance between the wires is greater at the bottom than at the top, which condition causes the gauge to increase as the sand wears down the wires. The STANCLIFF SCREEN KEEPS ITS GAUGE because the distance between the wires is the same at the top and bottom.

SMITH SET SHOE

1. This set shoe is designed to obviate the trapping of trash under the valve seat. An inverted cone causes valve to seat more firmly at higher pressure. Stream lines of cone give large space for flow.
2. Extra strong, durable springs keep back-pressure valves seated firmly when pressure is relieved.
3. Removable wash ring, threaded to the same specifications as pipe, to make closer connection. Beveled to facilitate entry of wash pipe.
4. Left-hand threading on Shoe insures being able to drill out Cast Iron Guide Plug, permitting deeper drilling with minimum loss of time. Guide plug also spot welded on shoe.



BREAK-OUT TONGS

1. The Stancliff Break-Out Tongs reverse without turning over.
2. These tongs are designed to stand up with little cost of upkeep. Removable keys stand all the wear.
3. The construction is simple—two jaws and one automatic latch.
4. One handle works with any size jaws.
5. Evenly distributed pressure assures no crushing of pipe. Instant grip and release.

SMITH products are recognized and used by major companies the world over because they give performance that brings added economies to the oil operator.
Write for complete information.

HOWARD SMITH COMPANY

2412 Railroad Avenue at Sawyer Street

Phone P-0131 HOUSTON TEXAS P. O. Box 688

COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

TEXAS

NORTH TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
ARCHER COUNTY—		
Baker et al, Turbeville 1	15	1404
Turbeville 1-B	35	1405
Bridwell Oil Co., Fails 7	55	1361
Continental Oil Co., Falls County 3-B	75	1146
Flake et al, Bell 1	*	1434
Golding-Cochran, Brown 9	30	1177
Jeske 3	20	1177
Winters 1	*	1555
Hudspeth - Hickman, Abercrombie-Taylor 2	*	1800
Maxson et al, Green 7	40	1131
Pois & Schultz, Green 1	65	1148
Ray & Art, Green 1	*	1210
Rickey Oil Co., Hardegree 1	*	1505
Shappell Oil Co., K&K 2-E	35	1799
L. E. Trout et al, Riggs 1	*	1834
BAYLOR COUNTY—		
Fain-McGaha Oil Corp., Portwood 1-G	*	1420
Turner et al, Portwood 1	*	1503
COOKE COUNTY—		
Fain-McGaha Oil Corp., Otto 2	*	1088
HASKELL COUNTY—		
Roeser-Pendleton, Inc., Reynolds 1	*	2155
JACK COUNTY—		
Watchorn O&G Co., Deck 1	*	2145
THROCKMORTON COUNTY—		
Gulf Prod. Co., J. A. Mathews 1	*	1800
Junker & Perkins, Marcell 1	*	1502
Seitz et al, Kelly 1	*	1002
WICHITA COUNTY—		
Arkansas Fuel Oil Co., K&K 37-A	35	1768
Clark et al, Bickley 5	75	858
Colton et al, Chilson 1	10	792
Hammond & Waggoner, Waggoner Bros. 1	20	1292
Lambert & Trout, Overby 5	*	697
Overby 6	50	1246
O'Neil et al, Honaker 1	*	1043
Panhandle Ref. Co., Burnett 14-A	*	1500
Schaffke & Blair, Honaker 3	50	858
Steel Drlg. Co. & King Rpy Co., K&K 1	*	831
Welfe et al, K&K 5	*	715
K&K 6	10	702
K&K 7	*	714
K&K 8	30	710
WILBARGER COUNTY—		
Faubin et al, Waggoner 1	*	925
Heydrick et al, Rhoads 1	*	2803
McCarty Oil Co., Waggoner 1-B	*	1953
YOUNG COUNTY—		
Baker & Omohundro, Powell 1	*	1365
Bolin & Lindsey, Wolf 8	20	882
Combest et al, Rogers 1	*	1085
Cooper & Hamilton, Crain 2	*	1006
Fain-McGaha Oil Corp., Thompson 1	*	812
Harrison et al, Hardy 1	*	700
Hawkins & Holcomb, Garvey 1	*	912
Hill et al, Dietrich 1	*	1160
Independent O&G Co., Larimore 7	10	750
Larimore 12	400	709
Julian Oil Co. & Stripling, Larimore 7	150	716
Larimore 8	400	709
King Royalty Co. & Bullington, Graham 3	400	701
Graham 4	450	712
Kleiner & Riggs, Larimore 1-A	*	792
McLester Oil Co., Burns 1	*	3919
Morris & Dunn, Larimore 1	*	730
Panhandle Ref. Co., Watson 3	10	669
Paramount Oil Royalties, Thomas 3	*	1250
Primrose Ref. Co., Kilpatrick 1	*	915
E. R. Riggs et al, Larimore 13	250	713
Shirner et al, Corley 1	*	980
United Producers Co., Larimore 1	75	707
Williams et al, Haygood 1	*	753
Wise & Jackson, Marshall 1	*	603

CENTRAL WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
BROWN COUNTY—		
Bonwell et al, Cabler 1	*	1785
Bush & Roberts, Richardson 2	*	650
L. C. Geisendorf et al, Wise 2	*	565

Tabulation and Comparison on page 202

Company, Well and Location	Initial Production Bbls.	Depth
Paramount Oil Royalties Corp. et al, McDonald 1	*	1180
E. L. Smith Oil Co., Pugh 1	*	1306
CALLAHAN COUNTY—		
Bearman et al, Hinds 1	*	1264
Guffy et al, George 1	*	1100
John Kleiner et al, Seale 1	*	758
Star Drlg. Co., Finley 2-B	¶½	918
COLEMAN COUNTY—		
Hoffer Oil Corp., Bragg 1	*	1300
Lloyd Oil Corp., Bartholomew 13	*	893
COMANCHE COUNTY—		
Anderson et al, Plumlee 1	*	3220
EASTLAND COUNTY—		
Amyx et al, Connellee 1-B	*	1510
ERATH COUNTY—		
Associated Prod. Co., Smith 1	*	3375
PALO PINTO COUNTY—		
Richardson et al, Storm 1	*	1799
T. P. Coal & Oil Co., A. Ashworth-Fee 1	*	3200
SHACKELFORD COUNTY—		
Sedgwick O&G Co. & Webb, Jeter 1	15	980
STEPHENS COUNTY—		
Hickok Prod. & Dev. Co., Paschal 1	5	3125

WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
ECTOR COUNTY—		
Penn Oil Co., Kloh 1	*	1550
GLASSCOCK COUNTY—		
Associated Oil Co., Coffee 1	*	2600
HOWARD COUNTY—		
Ward Oil Co., Roberts 18	80	1374
IRION COUNTY—		
Carl Cromwell et al, Tankersley 2	*	1633
MITCHELL COUNTY—		
Gant & Teas, J. J. Handley 1	*	3115
PECOS COUNTY—		
The California Co., M. A. Smith 10, Lse. 1, Sec. 23	9200	1795
Gulf Prod. Co., I. G. Yates 31	12,900	1300
WARD COUNTY—		
Sid Richardson et al, O'Brien 3	180	2815

TEXAS PANHANDLE

Company, Well and Location	Initial Production Bbls.	Depth
CARSON COUNTY—		
McMan O&G Co., J. L. Noel 3	75	3253
CHILDRESS COUNTY—		
Continental Oil Co.-Sun Oil Co., T. L. Johnson 1	*	3830
GRAY COUNTY—		
Dixon Creek Oil Co., W. W. Harrah 3	250	3230
Gulf Prod. Co., P. A. Worley 7-A	415	2872
Lefors Pet. Co., Davis-Shaw 3	¶17½	2380
Magnolia Pet. Co., S. Faulkner 9	¶4-670	2910
J. M. Saunders-Midwest 1	620	3015
McIlroy Oil Co., W. C. Archer 4	275	3240
Shamrock O&G Co., Worley-Reynolds 1	510	2984
The Texas Co., W. W. Harrah 1	450	3250
Combs-Worley 8	185	2911
J. E. Wright 5	¶6-1750	2810
HUTCHINSON COUNTY—		
Danciger O&R Co., R. F. Cheatham 1	485	3067
Phillips Pet. Co., Johnson-Rudy 1	¶70	3346
Skiatex Oil Co., Kingsland 9	250	2959
WHEELER COUNTY—		
Lone Star Gas Co., Edwards-Trostle 3	¶28	1958
Murchison-Fain-McGaha, Close 19	¶19	1660
Magnolia Car Rack Fee 1	¶17	1690

CENTRAL EAST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
VAN ZANDT COUNTY—		
Humble O&R Co., J. A. Freeman 1	*	3505
Pure Oil Co., Thompson 7	12,000	2929
Van Methodist Church 1	3500	2929

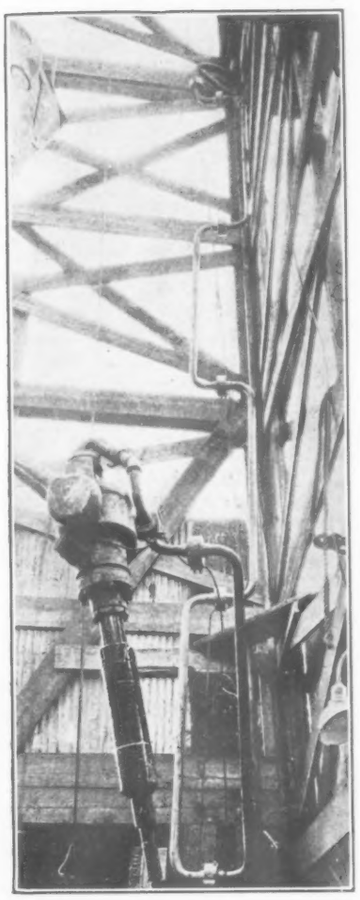
SOUTH TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
CALDWELL COUNTY—		
Humble Oil Co., New 5	175	2215
DUVAL COUNTY—		
Humble Oil Co., Koehler 47	10	1736
GUADALUPE COUNTY—		
Gulf Prod. Co., Molear 2	..	....
McKean 9	..	....
KARNES COUNTY—		
Morgan et al, Boyce 1	*	5280
L. W. Capps et al, Wilburn 1	*	4015
NUECES COUNTY—		
W. L. Pearson, Donigan 1, 6 mi w Corpus Christi	10	4004
South Texas Prod. Co., Daudemann 1	*	4008
WEBB COUNTY—		
O. W. Killam, Bruni 5	¶1	2847
ZAPATA COUNTY—		
Allied Gas Co., Trevino 7-A	100	1233
Trevino 8-A	75	1233
Trevino 10-A	30	1224
Edgington & Niles, Trevino 5, Blk 26	350	1219
Trevino 2-B	¶20	1219
SRC Corporation, Cuellar 6-B	65	1231
Cuellar 7-B	¶40	1228
Cuellar 8-B	70	1238
South Texas Prod. Co., Martinez 2, Sur. 6	¶20	1864

TEXAS GULF COAST

Company, Well and Location	Initial Production Bbls.	Depth
BARBERS HILL—		
Yount-Lee Oil Co., Fisher 2	1500	5720
Sun Oil Co., Wilburn Fee 1	500	5193
McAlbert Oil Co., Woodward 1	800	5341
CLAY CREEK—		
Sun Oil Co., Grote 9	*	3198
Mrs. B. R. Clay 4, J. F. Perry sur.	*	3331
DANBURY—		
Shell Pet. Corp., Blakely-Winston 3, w side Austin Bayou	*	1745
HOCKLEY—		
Humble O. & Ref. Co., Warren 7, H. Ehrenburg sur.	*	7063
HANKAMER—		
Gulf Prod. Co., Boyt 7	400	4100
PETTUS—		
Baxter Prod. Co., Barnett Heirs 1, John Pace sur.	120	3645
Cosden Oil Co., McKinney 2, John Pace sur.	2040	3668
Houston Oil Co., Neumann 1, G. A. Kerr sur.	300	3698
RACCOON BEND—		
McInnery & Harris, Hattie McDade 1, Jno. Martin sur.	*	500
Humble O. & Ref. Co., Bellville School 5	260	3386
SARATOGA—		
Rio Bravo Oil Co., Cotton 87-A	15	550
SPINDLE TOP—		
Yount-Lee Oil Co., McFadden 33	125	2550
SUGAR LAND—		
Humble O. & Ref. Co., Brazos Farm 15	218	3748
REFUGIO—		
Independent O&G Co., Mitchell 1	*	....
Edwin M. Jones, J. F. B. Heard 4-A	300	3661
COVE—		
Pure Oil Co., Kirby 1, Chas. Tilton sur.	*	6669
BIG HILL—		
The Texas Co., Pipkin 3	*	1677
NORTH DAYTON—		
Abercrombie and Harrison, Jameison 1	2000	4461
BLUE RIDGE—		
Navarro Oil Co., Robinson 9-A	*	5244
GRIMES COUNTY—		
Cranfill and Reynolds, Stoneham 1	*	3400

MacCLATCHIE'S NEW HOSE is guaranteed to *out-perform any other metal hose* and to *save you money*



FULLY confident that the new all-steel rotary hose is going to take its place beside the famous MacClatchie valve as standard equipment throughout the world, we offer the above guarantee. You may order this hose on trial today . . . test it in day-in-and-day-out service in the field . . . and if you are not entirely satisfied, we'll take it back.

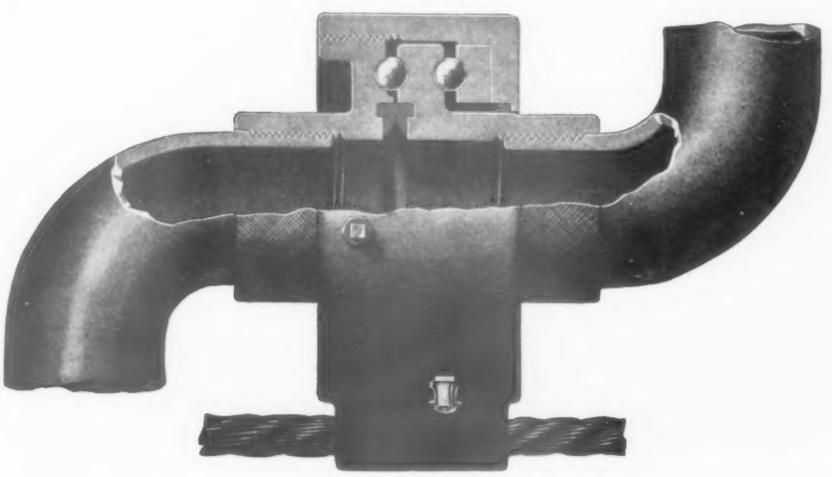
Such guarantees are given only after a manufacturer is absolutely sure of his product. Months of field testing have proven that the MacClatchie All-Steel Rotary Hose has maximum flexibility under the highest pressures; that it cannot be placed in a cramped position. Simple in design and sturdy, with an unobstructed fluid course and no sharp bends, the MacClatchie hose will never disappoint you, no matter under what circumstances you use it.

We know these things and we want you to order a hose on trial so that you may prove them to yourself.

The price brings it within the reach of even the smallest operator . . . the simplicity of the design makes it possible to establish such a price. It is made in 2½" or 3" sizes. The five-length assembly . . . 37½' long . . . is standard, but any other assembly can be furnished. The picture on the left shows the hose hung up in the derrick, with the kelly in the rat-hole.

A folder, describing the new hose in detail, will be sent to you on request. Order a hose on trial today.

MacClatchie Manufacturing Co.,
Compton, Calif.



In the cut-away section of a swivel union (right) note the simplicity of construction. All parts can be easily replaced in a few moments. The automatic rubber packing works on the "cup-leather" principle of expansion. The five-section hose, 37 ft. long, is standard, but any assembly is immediately available. The hose is made in either 2½" or 3" size.

OKLAHOMA

Company, Well and Location	Initial Production Bbls.	Depth
CLEVELAND COUNTY—		
Continental Oil Co., Sudik 1, nw c ne, 6-10-2w	12713	6705
COTTON COUNTY—		
J. D. Nantz, Mah-bah-quak 2, nw se nw, 29-1s-9w	*	2248
CREEK COUNTY—		
J. A. Swindler et al, Micco 1, se sw sw, 7-14-10e	18	2685
C. G. Tibbens O&G, Bartlett 2, ne sw nw, 18-14-9e	25	2366
Baker 3, se nw nw, 18-14-9e	22	2323
Phillips Pet. and Gled Oil, Carter 3, cwl nw se, 20-19-9e	210	2248
C. O. Buckles et al, Morgan 1a, se nw nw, 14-19-9e	150	2181
I.T.I.O., Anthis 2, sw ne sw, 25-19-8e	15	2370
O. M. Irelan, Baker 1, ne c se, 10-17-10e	*	2570
GRANT COUNTY—		
Argo Oil Co., Howell 2, se sw sw, 14-27-3w, 90 bbls. water	35	4560
HUGHES COUNTY—		
R. P. Wheelan, Peters 1, se sw ne, 8-6-10e	*	640
LATIMER COUNTY—		
Limestone O&G, Shaw 1, nw ne nw, 23-5-18e	*	3608
LINCOLN COUNTY—		
Magnolia Pet. Co., Staubus 3, nw sw se, 8-14-4e	*	5293
T. B. Slick, Fee 1, ne c sw, 7-14-4e	2157	5101
MUSKOGEE COUNTY—		
Midwestern O&G, Lacey 1, c nw ne, 31-12-19e	¶2	600
Beard & Elliott, Dickson 2, sw se sw, 3-13-16e	15	1774
W. J. Metzger, Francis 12, sw ne sw, 1-14-18e	20	908
J. R. Parks, Rentie 1, se ne sw, 15-15-18e	¶1½	1023
D. L. T. Company, Mackey 5, se c sw ne sw, 9-15-18e	56	1004
C. E. Creager Trustee, Townlot 1, sw c ne nw, 35-15-18e	40	1090
C. F. Finefield et al, Fields 1, ne c nw se nw, 9-15-18e	*	942
Ray et al, Bruner 1, nw c sw nw, 16-15-18e	*	1160
NOBLE COUNTY—		
Magnolia Pet. Co., Sams 4, se sw sw, 15-12-2w	150	5170
Gypsy Oil Co. et al, Bergstram 1, se c nw, 28-22-1w	*	5644
OKLAHOMA COUNTY—		
I.T.I.O., Theimer 5, nw sw se, 1-11-3w	1044	6388
Brokaw 4, se ne ne, 13-11-3w	775	6397
Rensimer 1, sw ne nw, 14-11-3w	3755	6520
Sinclair O&G, Donnell 1, se ne nw, 23-11-3w	3060	6597
I.T.I.O. Peterson 2, se c sw, 25-11-3w	9904	6642
Sinclair O&G School Land 15, ne sw ne, 36-11-3w	7370	6676
School Land 16, se sw ne, 36-11-3w	15545	6635
I.T.I.O. Sudik 7, sw nw sw, 31-11-2w	10933	6694
Sudik 4, se ne sw, 31-11-2w	16199	6660
OKMULGEE COUNTY—		
LaBean Drilling Co., Bruner 7, c ne sw, 23-15-11e	12	1855
S. J. Mathews, Hughes 1a, ne c 21-16-11e	10	2460
F. Sheedy, Myers 16, ne c se sw, 23-13-14e	*	1288
W. B. Pine, Doyle 1, (owdd) ne c se nw, 18-15-13e	*	2738
OSAGE COUNTY—		
Mid Co. Oil, 23, se c ne se, 18-22-10e	10	1385
I.T.I.O. 409, ne c se, 6-24-9e	¶3½	1939
434, sw c, 22-27-11e	¶1½	1867
Peters Pet. Co., et al, 1, se c sw, 8-25-9e	*	2290
13, sw c nw ne nw, 17-27-6e	*	3059
PAWNEE COUNTY—		
Thompson & Black, Mote 2a, ne c nw nw sw, 14-20-9e	¶2	954
PAYNE COUNTY—		
Twin State Oil Co., Davis 1, ne c nw ne, 20-19-5e	40	3874
POTTAWATOMIE COUNTY—		
Transcontinental Oil Co., Miller 1, se ne ne, 22-6-3e	1927	3533
SEMINOLE COUNTY—		
Carter Oil, Chowning 6, se sw sw, 19-9-6e	400	4209
Deeprock Oil Corp., Johnson 1, se nw ne, 30-8-8e	112	3258
Independent O&G, Okfusgee 5, ne sw nw, 16-6-6e	90	2905
Mid-Continent Pet. Corp. Harjo 3, se sw se, 20-6-6e 4 hrs.	2885	2924
Harjo 4, sw c se, 20-6-6e	4515	2939
Empire O&R, Caesar 1, sw ne sw, 21-6-6e	¶3½	2700
Magnolia Pet., Saketka 1, nw sw ne, 31-6-8e	*	2840
Culbertson et al, Blankenship 1, sw se se, 10-8-5e	*	3855
Magnolia Pet. Palmer 1, ne se sw, 31-6-8e	*	4617
STEPHENS COUNTY—		
Wirt Franklin Pet. Corp. School Land 3, nw c sw sw sw, 36-1s-10w	15	2202
Spain 3, se sw nw, 9-2s-6w	*	5044
TULSA COUNTY—		
Pure Oil Co., Brightman 2, cnl se ne, 30-19-10e	100	2228
WAGONER COUNTY—		
R. L. North, Kanard 3, sw c ne se, 31-18-17e	¶1¼	409

KANSAS

Company, Well and Location	Initial Production Bbls.	Depth
BUTLER COUNTY—		
Empire O&R, Koogler 99, ne nw se 20-26-5e	100	2594
Magnolia Pet. Co., Koogler 63, nw c sw 21-26-5e	130	2483
Empire O&R, Covert 1, se sw se, 3-28-5e	*	3214
CHASE COUNTY—		
Steinbuchel et al, Stevenson 1, c sw, 4-20-6e	*	2185
COWLEY COUNTY—		
J. A. Hull Oil Co., Kukuk 20, sw se ne, 24-32-4e	100	3041
Mid Kansas Oil & Gas Co., Brewer 1, c ne nw, 21-31-6e	*	2932
EDWARDS COUNTY—		
Dixie Oil and Amerada, McCarthy 1, sw c, 22-25-17w	¶7	4472
ELK COUNTY—		
Silurian Oil Co., Cheney 1, c se se se, 8-29-11e	*	1810
MARION COUNTY—		
General Utilities Co., Propp 1, ne se sw, 8-19-4e	*	2715
Skelly Oil Co., Hehl 1, nw c ne, 11-20-4e	*	2649
Empire O&R, Blakely 1, nw ne sw, 30-20-4e	*	2684
General Utilities Co., Burkholder 1, csl n½ se, 8-19-3e	*	2920
Youker et al, Holbeck 1, se sw ne, 10-17-4e	*	2470
McPHERSON COUNTY—		
Sinclair O&G, McCurdy 2, sw se se, 33-20-3w	500	3313
McCurdy 3, nw se se, 33-20-3w	600	3305
W. C. McBride Inc., Krehbiel 1, se sw ne, 4-21-3w	500	3470
Sinclair O&G, Morehouse 3, se ne ne, 4-21-3w	890	3395
Morehouse 7, sw ne ne, 4-21-3w	550	3389
Morehouse 8, se nw ne, 4-21-3w	575	3392
Morehouse 9, nw ne ne, 4-21-3w	525	3325
Mid Kansas O&G, Voshell 8, ne sw ne, 9-21-3w (owdd)	1430	3384
MORRIS COUNTY—		
Anderson et al, Pope 1, nw ne se, 15-16-7e	¶1	460
MORTON COUNTY—		
Argus Prod. Co., Mangle 1, c sw, 19-33-39w	¶¾	2752
Argus Prod. Co., Hayward 1, c nw, 31-33-39w	¶13½	2785
Armstrong 2, c sw, 4-34-39w	¶11	2900
Mangle 1, c sw, 6-34-39w	¶3	2900
Hayward 1, c sw, 9-34-39w	¶14	2897
Dixon 1, c se, 18-34-39w	¶4	2885
RICE COUNTY—		
Rogers et al, Gill 1, sw c se, 27-20-10w	*	3041
Miller et al, Williams 1, c se, 35-20-8e	*	3400
RILEY COUNTY—		
General Utilities Co., Gray 1, ne c se, 30-6-6e	*	2535
Youker et al, Thierer 1, nw c 20-10-7e	*	3020
STEVENS COUNTY—		
Argus Prod. Co., Barrows 1, c sw, 32-34-38w	¶5	2900
Trees Oil Co., Meyers 1, c nw, 10-35-38w	¶8	2797
Argus Prod. Co., Abser 1, c nw, 7-35-37w	¶4½	2902

CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
ELWOOD—		
Signal Oil & Gas Co., Permit 98-2	850	3686
LONG BEACH—		
E. E. Coombs, 14	462	7095
Community Monarch Pet. Co., Aidline 1	600	6963
Dabney Johnson 52	2237	7005
ORELLA—		
General Pet. Corp., Erburu 6	100	1373
ROUND MOUNTAIN—		
Shell Oil Co., Olcese 1	70	2240
SANTA FE SPRINGS—		
Bellview, 5	1307	5053
The Texas Co., Matern No. 2, 11	197	6306
Union Oil Co., Bell 59	1065	5225
SOUTH MOUNTAIN—		
Union Oil Co., Crane 4	125	4444
VENICE—		
Santa Fe Springs Oil Co., 1	187	6045

LOUISIANA

SOUTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
VINTON—		
Gulf Ref. Co. of La., Gardiner 3	2150	3440
Supreme Oil Co., Gray 1	500	2880
Wilson Broach, Wilson 3	800	3500
PORT BARRE—		
Alex Rice, Trustee, Futral 1	*	4600
The Texas Co., Botany Bay 8	1000	3380
BAYOU BLUE—		
Standard Oil Co. of La., Schwing 5, Iberville	200	2300
TERREBONNE PARISH—		
The Texas Co., Lake Barre State 4, 20-21s-20e	1200	3660

NORTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
BOSSIER PARISH—		
The Texas Co.'s Wilkinson 12, 36-23-12	525	3154
Woodley Pet. Co.'s Schuler 1, 13-17-12	¶26	2456
CADDO PARISH—		
Falcon Oil Co.'s Muslow 4, 29-20-15 (loc)	*	
MOREHOUSE PARISH—		
Industrial Gas Co. Fee 1, 3-20-4	¶9	2148
RICHLAND PARISH—		
Palmer Corp.'s Newberry 1, 2-16-6	39*	2450
N. D. Thomason 1, 22-16-6	¶26	2450
United Carbon Co.'s E. W. Dunning 1,	¶17	2440
H. L. Thomason 1, 2-16-6	¶48	2440
SABINE PARISH—		
Loring Oil Co.'s Gardner 1, 27-8-12	3000	2327
Ruston Drlg. Co. 1-B, Bowman-Hicks 24-7-14	*	2470
1-A, Bowman-Hicks 35-8-12	*	2690
1 Bowman-Hicks 4-7-12	*	2640
Standard Oil Co.'s Ives 2, 34-10-12	*	3306
UNION PARISH—		
J. P. White's Howard 1, 32-20-3	¶2	2183

ARKANSAS

Company, Well and Location	Initial Production Bbls.	Depth
UNION COUNTY—		
Lion Oil Ref. Co.'s Kelly 2, 9-17-14	5	3195

STEEL SPECIALISTS

TESCO HIGH TEST STEEL

for your

STEEL CASTINGS

Exacting technical men want their steel castings made right. They want to feel sure that their patterns are carefully taken care of and they want delivery when promised. In this plant the particular man will find the skilled craftsmen and the modern equipment to take care of these things for him.

PATTERN STORAGE

Modern fireproof, brick pattern storage—steel shelving throughout assures you that no harm will come to your patterns in this plant. Built so as to prevent excessive drying out or warping of patterns. Complete record of each pattern is kept and every pattern is insured.

ANALYSIS CONTROL

Chemical analysis made on every heat before it is taken from furnace, under direction of own metallurgist. Test bars are made for tensile and bending tests. Utmost care is given to physical as well as chemical properties.

DELIVERED WHEN PROMISED

TEXAS ELECTRIC STEEL CASTINGS CO.

BRINGHURST AND GILLESPIE STREETS, HOUSTON, TEXAS

"Build with Steel Castings"

EASTERN STATES

PENNSYLVANIA

Company, Well and Location	Initial Production Bbls.	Depth
BRADFORD FIELD—		
South Penn Oil Co., Enterprise 3	2	....
Satterfield 1	3	....
Wheeler 2	2	....
W. H. Emery, Mills 1	3	....
Stuchel & Freeman, Freeman 3	4	....
Bovaird & Co., Quintruple 1	2	....
Healey Petroleum Corp., Quintruple 45	2	....
E. A. Williams & Co., Drake 13	2	....
Grant & Mohan, Bingham 368 tr 11	3	....
E. O. Sage, Patterson 1	3	....
Hungiville & Co., Fee 1	2	....
L. F. Kinley, Montz 62	2	....
Blaidsell Oil Co., Blaidsell 1	2	....
Bradford Producing Co., Weston 70	2	....
Weston 71	2	....
Holmes Oil Co., Franchot 1	2	....
G. W. Crooks Estate, Crooks 13	3	....
McKean County Trust Co., Griffith 6	3	....
Griffith 7	3	....
Niagara Oil Corp., Lawton 2	2	....
F. Southard, Southard 6	2	....
Healey Petroleum Corp., Morris 1	2	....
BUTLER COUNTY—		
A. Z. Burke & Co., Duffey 4	2	....
G. W. P. Orton, Moore 8	2	....
M. B. Finnessy, McCullough 7	2	....
T. A. Lindsay, Lindsay 1	*	....
CLARION-VENANGO COUNTIES—		
Shaffer Oil Co., Van Camp 4	2	....
Steadman & Co., Rupert 1	*	....
GREENE COUNTY—		
Fry & McCracken, McGinnis 2	¶1¼	....
Philadelphia Gas Co., Stevens 3	¶¼	....
Reesor 2982	¶1	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
KANAWHA COUNTY—		
Cannelton Coal Co., Fee 3	¶¼	3098
G. L. Cabot Inc., Tompkins 3	¶¼	2480
United Fuel Gas Co., Campbell 4216	¶1¼	1788
Miller 4245	¶½	....
CALHOUN COUNTY—		
Chemical Oil Co., Bennett Hrs. 20	¶¼	....
F. F. McIntosh, McDonald 1	¶1	....
G. L. Cabot Inc., Burkley 710	¶2	2018
CABELL COUNTY—		
United Fuel Gas Co., Dunkle 4244	¶¼	3052
Larner Gas Co., McComas 95	¶¼	....
MARSHALL COUNTY—		
Manufacturers Light & Heat Co., Fletcher 2617	¶1¼	2728
Fry & McCracken, McGinnis 1	¶½	1544
MONONGALIA COUNTY—		
Philadelphia Gas Co., Bissett 1	¶¼	3564
Manufacturers Light & Heat Co., Bean 1	¶¼	3625
ROANE COUNTY—		
Hope Construction & Refg. Co., Vandale 1107	10	....
WAYNE COUNTY—		
Hoffman & Meabon, Jackson 1	2	....
CLAY COUNTY—		
Virginia Gasoline & Oil Co. Brown-Swan 4000	¶¼	1903
FAYETTE COUNTY—		
Groscup & Co., Black Betsy Coal Co. 3	¶¼	3155
MINGO COUNTY—		
Kermit Gas Co., Wiles 1	¶1	2973
LOGAN COUNTY—		
W. J. Peterson, Ball 1	¶½	2428
JACKSON COUNTY—		
Here, Sheppard & Co., Streets 1	*	2640

KENTUCKY

Company, Well and Location	Initial Production Bbls.	Depth
McLEAN COUNTY—		
Cameron & Thompson, McManama 1	65	1001
CUMBERLAND COUNTY—		
B. H. Allen, Hastings 1	*	....
BARREN COUNTY—		
Missouri-Kansas Pipe Line Co., Glasgow Junction 1	¶2	....
J. W. Porter & Co., Mayfield 5	1	553
Mayfield Hrs. 3	3	530
H. R. Norris, Richardson 1	*	....
Joe Leach & Sons, Pace 1	*	....
HENDERSON COUNTY—		
Wood Oil Co., Hamilton Hrs. 1	*	....
Esslinger & Co., Branson 1	*	....
Niagara Oil Corp., Robards 1	4	....
Slavey 2	¶¼	....
Slavey 3	¶¾	....
DAVIESS COUNTY—		
Dr. Sirman Co., Atherton 2	70	....
Hupp & Duff, Hayden 4	75	....
Hayden 5	75	....
Noel 4	60	....
Dr. Sirman Co., Atherton 1	102	....
Eastern Gulf Oil Co., Christian 1	20	....
H. C. Smith Co., Simmons 2	10	....
Johnson Oil & Refg. Co., Foster 1	*	....
OHIO COUNTY—		
Jas. C. Ellis & Co., Kelley 2	¶½	724
Mills 2	¶¼	440
Crow-Connor 3	30	....
Crow-Connor 4	35	....
Morgan 3	25	....
Talley 5	25	....
Bartlett 2	*	....
N. W. Shearella Trus. Park 1	100	380
Brown & Co., Hickey 4	10	....
Leeper Oil Co., Blackerby 3	30	....
Greer 4	25	....
S. R. Berry & Co., Coleman 3	22	400
Chester Oil Co., Medcalf 11	25	410
S. H. Russell, King 1	¶½	....
Cumberland Petroleum Co., Hamilton 7	*	....

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
WASHINGTON COUNTY—		
Wharden-Fulmer Co., Alloway 1	*	1628
Walter Brown Hrs. Collins 6	4	1618
McVey Bros. Cordery Sisters 1	3	1827
MONROE COUNTY—		
Shaffer Farm Oil Co., Martin 1	2	1692
Local Oil Co., Mallett 1	¶¼	1710
Wittmer Prop. Trus. Kernen 1	*	2172
JEFFERSON COUNTY—		
Graham & Co., Smith 1	2	1500
NOBLE COUNTY—		
Ohio Fuel Gas Co., Colland 1	¶¼	1809

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
ATHENS COUNTY—		
Carpenter & Glazier, Curtis 8	*	210
Mosure & Co., Bean 12	*	374
Bode & Co., Whaley 12	1	1210
Frank Selby, Lovelle & Co. 3	¶¼	1582
Ohio Fuel Gas Co., Tom 1	*	1250
Wittmer Prop. Trus. Hocking Fire Clay 1	¶3½	3347
MUSKINGUM COUNTY—		
The Atha Co., Riley 1	*	4515
Craig, Adair & Co., Baughman 1	¶¾	3695
Midland Oil Co., Denney 4	120	3158
ASHLAND COUNTY—		
I. E. O'Hail, Doup 1	1¼	2724
Crownshield & Co., Wheeler 6	10	746

Company, Well and Location	Initial Production Bbls.	Depth
Robinson & Co., Smith 8	*	[illegible]
MEIGS COUNTY—		
Tyree & Co., Carnahan 20	4	[illegible]
Jividen 2	¶1¼	[illegible]
Ohio Fuel Gas Co., Salser 1	¶¼	[illegible]
GUERNSEY COUNTY—		
East Ohio Gas Co., Quillen 1	72	[illegible]
Ohio Fuel Gas Co., Oldham 1	*	[illegible]
TUSCARAWAS COUNTY—		
Gordon Oil Co., Hoffman 3	¶½	25 [illegible]
Euga 2	*	[illegible]
LORAIN COUNTY—		
McMillin & Co., Price 2	*	[illegible]
Ohio Fuel Gas Co., Penfound 1	¶¼	[illegible]
SUMMITT COUNTY—		
East Ohio Gas Co., Sorrick 1	¶2¼	[illegible]
Brendall & Co., Keck 1	¶¼	[illegible]
PERRY COUNTY—		
Allegheny Oil Co., Longstreth 5	5	[illegible]
LICKING COUNTY—		
Wehrle Gas Co., Dodson 2	¶¼	[illegible]
HOCKING COUNTY—		
Ohio Fuel Gas Co., Wolf 1	¶¾	[illegible]
KNOX COUNTY—		
Ohio Fuel Gas Co., Doup 1	*	[illegible]

NORTHWESTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
SANDUSKY COUNTY—		
Home Banking Co., Fought 6	2	1329
HARDIN COUNTY—		
Jupiter Oil Co., Price 1	5	....

INDIANA

Company, Well and Location	Initial Production Bbls.	Depth
PIKE COUNTY—		
F. B. Hillis, Trus. Lindy 1	25	1370
C. C. Taliaferro Jr., McAtee 6	*	1600
Kime 6	*	1450
E. C. Bolds, Atkinson 6	12	1030
GIBSON COUNTY—		
Big Four Oil & Gas Co., Sloan 4	55	1262

ILLINOIS

Company, Well and Location	Initial Production Bbls.	Depth
CRAWFORD COUNTY—		
Niagara Oil Corp., Apple 12	2	....
CUMBERLAND COUNTY—		
Paul J. Campbell, Kuhn 3	1	610

MICHIGAN

Company, Well and Location	Initial Production Bbls.	Depth
ISABELLA COUNTY—		
The Pure Oil Co., State-Isabella B-6	150	3575
Iosco B-2	50	....
BERRIN COUNTY—		
Dixie Oil Co. & Co. Community lease 1	*	882
W. E. Eldridge, Wetteran 1	*	1775
SHIAWASSEE COUNTY—		
O. L. Barnaby & Co., Galloway 1	10	1800

C. L. & W. W. Auer, Corry, Pennsylvania, manufacturers of valve cups and leather specialties, have recently occupied their new modern building, located at East Wayne and Congress streets, Corry. The present owners are successors of C. A. Auer, manufacturer of hydraulic leather since 1882. The manufacture of packings began at about 1912.

The Auer cup works specializes in the manufacture of "Seep" and "Star" cups for oil field uses. Their products include working barrel cups, casing cups, valve leathers, leather discs, formed valve leathers, gaskets, valve rings, U-cups, flange packings, and facings for pumps and standing valve rings.

Products of the company are being sold throughout the world. The company, with only a small business in 1910, turned out more than 1,000,000 pieces last year.

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—the most central location and the finest facilities available in any one city for serving *all* the oil fields of the Southwest, including—

Overnight Pullman service to all important centers and producing fields.

Network of air lines, operating latest equipment on regular schedules, reaching all points of interest to the industry within one to four hours.

Best banking facilities in the Southwest—large commercial banks thoroughly acquainted with the industry's requirements—the Southwest's largest bank—the Federal Reserve Bank for the Eleventh District.

Ideal living conditions—some of the most beautiful residential sections in America—State Fair of Texas—numerous golf courses—grand opera season—football contests each season that attract Nation-wide interest—many other opportunities for amusement and recreation.

Many oil companies, supply companies, geologists, engineers and others identified with the industry now maintain headquarters in Dallas, making this city one of the most important oil centers in the country.

The Tower Petroleum Building, under construction, offers adequate space for companies now less centrally located to the various fields of the Southwest, or desiring to concentrate at one central location facilities that are now being maintained at several points.

For further information write

INDUSTRIAL DALLAS, Inc.

701 Chamber of Commerce Building,

DALLAS, TEXAS

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PENN OIL COMPANY
SOUTHERN UNION GAS COMPANY
LUCEY PETROLEUM COMPANY
TOWER PETROLEUM BUILDING
(McNeny & McNeny)

EASTERN STATES

PENNSYLVANIA

Company, Well and Location	Initial Production Bbls.	Depth
BRADFORD FIELD—		
South Penn Oil Co., Enterprise 3	2	....
Satterfield 1	3	....
Wheeler 2	2	....
W. H. Emery, Mills 1	3	....
Stuchel & Freeman, Freeman 3	4	....
Bovaird & Co., Quintruple 1	2	....
Healey Petroleum Corp., Quintruple 45	2	....
E. A. Williams & Co., Drake 13	2	....
Grant & Mohan, Bingham 368 tr 11	3	....
E. O. Sage, Patterson 1	3	....
Hungiville & Co., Fee 1	2	....
L. F. Kinley, Moutz 62	2	....
Blaidsell Oil Co., Blaidsell 1	2	....
Bradford Producing Co., Weston 70	2	....
Weston 71	2	....
Holmes Oil Co., Franchot 1	2	....
G. W. Crooks Estate, Crooks 13	3	....
McKean County Trust Co., Griffith 6	3	....
Griffith 7	3	....
Niagara Oil Corp., Lawton 2	2	....
F. Southard, Southard 6	2	....
Healey Petroleum Corp., Morris 1	2	....
BUTLER COUNTY—		
A. Z. Burke & Co., Duffey 4	2	....
G. W. P. Orton, Moore 8	2	....
M. B. Finnessy, McCullough 7	2	....
T. A. Lindsay, Lindsay 1	*	....
CLARION-VENANGO COUNTIES—		
Shaffer Oil Co., Van Camp 4	2	....
Steadman & Co., Rupert 1	*	....
GREENE COUNTY—		
Fry & McCracken, McGinnis 2	¶1¼	....
Philadelphia Gas Co., Stevens 3	¶½	....
Reesor 2982	¶1	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
KANAWHA COUNTY—		
Cannelton Coal Co., Fee 3	¶¼	3098
G. L. Cabot Inc., Tompkins 3	¶¼	2480
United Fuel Gas Co., Campbell 4216	¶1¼	1788
Miller 4245	¶½	....
CALHOUN COUNTY—		
Chemical Oil Co., Bennett Hrs. 20	¶¼	....
F. F. McIntosh, McDonald 1	¶1	....
G. L. Cabot Inc., Burkley 710	¶2	2018
CABELL COUNTY—		
United Fuel Gas Co., Dunkle 4244	¶¼	3052
Larner Gas Co., McComas 95	¶¼	....
MARSHALL COUNTY—		
Manufacturers Light & Heat Co., Fletcher 2617	¶1¼	2728
Fry & McCracken, McGinnis 1	¶½	1544
MONONGALIA COUNTY—		
Philadelphia Gas Co., Bissett 1	¶¼	3564
Manufacturers Light & Heat Co., Bean 1	¶¼	3625
ROANE COUNTY—		
Hope Construction & Refg. Co., Vandale 1107	10	....
WAYNE COUNTY—		
Hoffman & Meabon, Jackson 1	2	....
CLAY COUNTY—		
Virginia Gasoline & Oil Co. Brown-Swan 4000	¶¼	1903
FAYETTE COUNTY—		
Groscup & Co., Black Betsy Coal Co. 3	¶¼	3155
MINGO COUNTY—		
Kermit Gas Co., Wiles 1	¶1	2973
LOGAN COUNTY—		
W. J. Peterson, Ball 1	¶½	2428
JACKSON COUNTY—		
Here, Sheppard & Co., Streets 1	*	2640

KENTUCKY

Company, Well and Location	Initial Production Bbls.	Depth
McLEAN COUNTY—		
Cameron & Thompson, McManama 1	65	1001
CUMBERLAND COUNTY—		
B. H. Allen, Hastings 1	*	....
BARREN COUNTY—		
Missouri-Kansas Pipe Line Co., Glasgow Junction 1	¶2	....
J. W. Porter & Co., Mayfield 5	1	553
Mayfield Hrs. 3	3	530
H. R. Norris, Richardson 1	*	....
Joe Leach & Sons, Pace 1	*	....
HENDERSON COUNTY—		
Wood Oil Co., Hamilton Hrs. 1	*	....
Esslinger & Co., Branson 1	*	....
Niagara Oil Corp., Rebards 1	4	....
Slavey 2	¶¼	....
Slavey 3	¶¼	....
DAVIESS COUNTY—		
Dr. Sirman Co., Atherton 2	70	....
Hupp & Duff, Hayden 4	75	....
Hayden 5	75	....
Noel 4	60	....
Dr. Sirman Co., Atherton 1	102	....
Eastern Gulf Oil Co., Christian 1	20	....
H. C. Smith Co., Simmons 2	10	....
Johnson Oil & Refg. Co., Foster 1	*	....
OHIO COUNTY—		
Jas. C. Ellis & Co., Kelley 2	¶½	724
Mills 2	¶¼	440
Crow-Connor 3	30	....
Crow-Connor 4	35	....
Morgan 3	25	....
Talley 5	25	....
Bartlett 2	*	....
N. W. Shearella Trus. Park 1	100	380
Brown & Co., Hickey 4	10	....
Leeper Oil Co., Blackerby 3	30	....
Greer 4	25	....
S. R. Berry & Co., Coleman 3	22	400
Chester Oil Co., Medcalf 11	25	410
S. H. Russell, King 1	¶½	....
Cumberland Petroleum Co., Hamilton 7	*	....

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
WASHINGTON COUNTY—		
Wharden-Fulmer Co., Alloway 1	*	1628
Walter Brown Hrs. Collins 6	4	1618
McVey Bros. Cordery Sisters 1	3	1827
MONROE COUNTY—		
Shaffer Farm Oil Co., Martin 1	2	1692
Local Oil Co., Mallett 1	¶¼	1710
Wittmer Prop. Trus. Kernen 1	*	2172
JEFFERSON COUNTY—		
Graham & Co., Smith 1	2	1500
NOBLE COUNTY—		
Ohio Fuel Gas Co., Colland 1	¶¼	1809

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
ATHENS COUNTY—		
Carpenter & Glazier, Curtis 8	*	210
Mosure & Co., Bean 12	*	374
Bode & Co., Whaley 12	1	1210
Frank Selby, Lovelle & Co. 3	¶¼	1582
Ohio Fuel Gas Co., Tom 1	*	1250
Wittmer Prop. Trus. Hocking Fire Clay 1	¶3½	3347
MUSKINGUM COUNTY—		
The Atha Co., Riley 1	*	4515
Craig, Adair & Co., Baughman 1	¶¼	3695
Midland Oil Co., Denney 4	120	3158
ASHLAND COUNTY—		
I. E. O'Hail, Doup 1	1¼	2724
Crownshield & Co., Wheeler 6	10	746
Robinson & Co., Smith 8	*	[illegible]
MEIGS COUNTY—		
Tyree & Co., Carnahan 20	4	[illegible]
Jividen 2	¶1¼	3612
Ohio Fuel Gas Co., Salser 1	¶¼	3600
GUERNSEY COUNTY—		
East Ohio Gas Co., Quillen 1	72	3504
Ohio Fuel Gas Co., Oldham 1	*	3305
TUSCARAWAS COUNTY—		
Gordon Oil Co., Hoffman 3	¶¼	25 3387
Euga 2	*	3041
LORAIN COUNTY—		
McMillin & Co., Price 2	*	[illegible]
Ohio Fuel Gas Co., Penfound 1	¶¼	[illegible]
SUMMITT COUNTY—		
East Ohio Gas Co., Sorrick 1	¶2¼	4002
Brendall & Co., Keck 1	¶¼	4023
PERRY COUNTY—		
Allegheny Oil Co., Longstreth 5	5	1124
LICKING COUNTY—		
Wehrle Gas Co., Dodson 2	¶¼	2920
HOCKING COUNTY—		
Ohio Fuel Gas Co., Wolf 1	¶¾	2153
KNOX COUNTY—		
Ohio Fuel Gas Co., Doup 1	*	[illegible]

NORTHWESTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
SANDUSKY COUNTY—		
Home Banking Co., Fought 6	2	1329
HARDIN COUNTY—		
Jupiter Oil Co., Price 1	5	[illegible]

INDIANA

Company, Well and Location	Initial Production Bbls.	Depth
PIKE COUNTY—		
F. B. Hillis, Trus. Lindy 1	25	1576
C. C. Taliaferro Jr., McAtee 6	*	1600
Kime 6	*	1450
E. C. Bolds, Atkinson 6	12	1030
GIBSON COUNTY—		
Big Four Oil & Gas Co., Sloan 4	55	1262

ILLINOIS

Company, Well and Location	Initial Production Bbls.	Depth
CRAWFORD COUNTY—		
Niagara Oil Corp., Apple 12	2	[illegible]
CUMBERLAND COUNTY—		
Paul J. Campbell, Kuhn 3	1	610

MICHIGAN

Company, Well and Location	Initial Production Bbls.	Depth
ISABELLA COUNTY—		
The Pure Oil Co., State-Isabella B-6	150	3570
Iosco B-2	50	[illegible]
BERRIN COUNTY—		
Dixie Oil Co. & Co. Community lease 1	*	882
W. E. Eldridge, Wetteran 1	*	1775
SHIAWASSEE COUNTY—		
O. L. Barnaby & Co., Galloway 1	10	1800

C. L. & W. W. Auer, Corry, Pennsylvania, manufacturers of valve cups and leather specialties, have recently occupied their new modern building, located at East Wayne and Congress streets, Corry. The present owners are successors of C. A. Auer, manufacturer of hydraulic leather since 1882. The manufacture of packings began at about 1912.

The Auer cup works specializes in the manufacture of "Seep" and "Star" cups for oil field uses. Their products include working barrel cups, casing cups, valve leathers, leather discs, formed valve leathers, gaskets, valve rings, U-cups, flange packings, and facings for pumps and standing valve rings.

Products of the company are being sold throughout the world. The company, with only a small business in 1910, turned out more than 1,000,000 pieces last year.

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Overnight Pullman service to all important centers and producing fields.

Network of air lines, operating latest equipment on regular schedules, reaching all points of interest to the industry within one to four hours.

Best banking facilities in the Southwest—large commercial banks thoroughly acquainted with the industry's requirements—the Southwest's largest bank—the Federal Reserve Bank for the Eleventh District.

Ideal living conditions—some of the most beautiful residential sections in America—State Fair of Texas—numerous golf courses—grand opera season—football contests each season that attract Nation-wide interest—many other opportunities for amusement and recreation.

Many oil companies, supply companies, geologists, engineers and others identified with the industry now maintain headquarters in Dallas, making this city one of the most important oil centers in the country.

The Tower Petroleum Building, under construction, offers adequate space for companies now less centrally located to the various fields of the Southwest, or desiring to concentrate at one central location facilities that are now being maintained at several points.

For further information write

INDUSTRIAL DALLAS, Inc.

701 Chamber of Commerce Building,

DALLAS, TEXAS

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LUCEY PETROLEUM COMPANY
TOWER PETROLEUM BUILDING
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WILDCATS FROM ALL SECTIONS

CENTRAL EAST TEXAS

Completion

Company, Well and Location	Production Bbls.	Depth
NAVARRO COUNTY—		
Wheelock & Collins, A. Mathews 1	*	3235

BOWIE COUNTY—Lee Timberlake et al's J. Tidwell 1, Jas. Eskell sur, top Pecan chalk 1229 ft, dr 2450 ft.

CAMP COUNTY—McDonald Bros.-Atlantic Oil Prod. Co.'s B. D. Tillery 1, J. H. Murphy sur, lcn.

CASS COUNTY—Phillips Pet. Co.'s Olds 1, dk.

DELTA COUNTY—C. A. Everetts et al's J. A. Smith 1, J. W. Renfro sur, sp and sd. Delta County Dev. Co.'s M. E. Hays 1, J. B. Anderson sur, dr 2655 ft. Hazel-Curtis Oil Co.'s T. J. Irwin 1, B. Williams sur, dr 2410 ft.

ELLIS COUNTY—G. C. Foster & S. C. Richardson's Moise-Cerf 1, LaPena sur, elev 440 ft, sd 2187 ft. E. M. Rogers et al's J. L. Winn 1, Orland Wheeler sur, rig. The Triangle Corp.'s W. B. Hale 1, B. Smith sur, Austin chalk 78 to 437 ft, Woodbine sand 836-1120 ft, dr 2012 ft.

FANNIN COUNTY—North American Pet. Co.'s Allen 1, W. A. Broadfoot sur, sd 975 ft. Ed. V. Parsons et al's Morgan 1, J. E. English sur, elev 668 ft, dr 3075 ft. E. M. Rogers et al's Mrs. E. C. McSwain 1, Juana Tolgade sur, fsh 1350 ft.

FRANKLIN COUNTY — Harper & Byers' A. J. Laws 1, D. G. Rogers sur, rig.

HENDERSON COUNTY—H. B. Ashburn et al's T. E. Terry 1, Arron York sur, elev 397 ft, sd 2510 ft. L. G. Bradstreet & Co.'s J. J. Shaughnessy 1, John Isard sur, sp and sd. E. L. Chapman et al's Cade 1, Simon Weiss sur, elev 340 ft, sd 3065 ft. Cranfill & Germany, Inc.'s C. C. Starr 1, G. Acosta sur, elev 434 ft, Pecan Gap chalk 2544-2770 ft, sd 3683 ft. Geo. L. Pace et al's S. Anthony 1, J. M. Betram sur, elev 410 ft, sp and sd. Sunray Oil Co.'s R. H. Davis 1, E. G. Harris sur, rig.

HUNT COUNTY—Fred B. Branson-C. A. Kelsey et al's J. S. West 1, Jas. Rhodes sur, elev 505 ft, Pecan chalk 1310-65 ft, top Austin chalk 1415 ft, coring 2785 ft.

KAUFMAN COUNTY—Otto R. Winter & Coastline Explorations, Inc.'s, John Barrow 1, R. A. Terrell sur, dr 658 ft.

LIMESTONE COUNTY — Haley-Heeman's Wilkes 1, J. Breeding sur, elev 421 ft, sd 1270 ft.

NAVARRO COUNTY — O. W. Killam & Phillips' L. N. Wilson 1, dr top Woodbine sand 1991 ft. Navarro Oil Co.'s W. N. Mathews 2, A. J. & P. M. Smith sur, Austin chalk 755-1075 ft, dr 1475 ft. Young et al's J. H. Farmer 1, Robt. Finley sur, top Austin chalk 787 ft, sd 960 ft.

RAINS COUNTY—D. H. Byrd et al's J. D. Hill 1, F. McMahon sur, elev 425 ft, Pecan chalk 2348-2546 ft, top Austin chalk 3790 ft, dr 4332 ft. Everett & Morrison's F. Franklin 1, John Christian sur, sp and sd.

RED RIVER COUNTY—E. L. Chapman et al's Morris-Guest 1, S. Lakin sur, sd 1450 ft.

RUSK COUNTY—E. M. Joiner et al's Bradford 3, elev 390 ft, Pecan chalk 2590-2744 ft, base Austin chalk 3480 ft, sd 3540 ft. Moss et al's Mathews 1, top Pecan chalk 2296 ft, sd 2330 ft.

SMITH COUNTY—E. L. Chapman et al's J. M. Hammon 1, Jas. Reid sur, elev 380 ft, Pecan chalk 2680-2912 ft, top Austin chalk 3900 ft, sd 4255 ft in chalk. McElreath & Suggett's J. Gillian 1, J. C. Robertson sur, sd 2455 ft. Owen-Sloan Oil Co. & R. H. Davis' J. H. Starnes 1, J. W. Allen sur, elev 417 ft, sd 1600 ft. Winona Oil Co.'s Morgan Freeman 1, A. J. LaGrone sur, dr 2755 ft.

TITUS COUNTY—Deep Rock Oil Co. et al's State Bank 1, H. W. Cobb sur, elev 410 ft, Pecan chalk 2406-2927 ft, top Austin chalk 4132 ft, top red beds 4264 ft, dr 4450 ft.

VAN ZANDT COUNTY—Bethel Oil Co.'s P. Smith 1, M. Neal sur, elev 435 ft, chalk 2555-2790 ft, sidetracked hole at 2640 ft, td 3708 ft. E. L. Chapman et al's Chas. T. Wolverton 1, Wm. James sur, elev 555 ft, sd 2905 ft. Doc Cooper et al's Elliott 1, W. H. Bundy sur, rig. W. T. Daniel et al's F. Cumby 1, J. Wright sur, elev 457 ft, Pecan chalk 1690-1730 ft, sd 2275 ft. Harry Helms et al's C. E. Vague 1, dk. L. G. Priest et al's Blanche Blewett 1, E. Porter sur, elev 566 ft, coring 2230 ft. Texas Chief Oil & Roy. Co.'s J. P. Foster 1, F. Montgomery sur, dr 1320 ft. Vanco Oil Co.'s Wages 1, dk. Van Zandt Oil & Dev. Co.'s Sharp-Robinson 1, J. B. Ybarbo sur, elev 373 ft, top Pecan chalk 2764 ft, top Austin chalk 4116 ft, dr 4465 ft.

VAN FIELD—Broderick & Calvert's M. F. Shirley 1, (2.07-ac strip) dk. Hartt Pet. Co.'s L. L. Swain 1, dk. Anderson et al's Sanger Bros. 1, rig. E. L. Chapman et al's Clark 1, dk. Humble O&R Co.'s R. S. Blake 1, dk; Freeman 1, abn 3505 ft. Imperator Oil Corp. et al's Carter 1, (Vacancy strip) dk; G. J. Luther 1, (Vacancy strip) sd in Pecan chalk 1602-55 ft. Roy Jenkins et al's M. E. Davis 1, dk. Pure Oil Co.'s M. L. McMahon 1, (48-ac) John Walling sur, rig; L. York 1, (39.6-ac) John Walling sur, lcn. The Texas Co.'s Carter 1, Pecan Gap chalk 1535-1690 ft, Austin chalk 2530-2723 ft, cored show oil in Woodbine sand 2805-06 ft, dr out cement plug 2806 ft.

ABBREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas—casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in.—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr — straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

WEST TEXAS

Completions

Company, Well and Location	Production Bbls.	Depth
COKE COUNTY—		
Lipan Oil Co. et al, Rawlings 1	*	3535
GLASSCOCK COUNTY—		
World Oil Co., Edwards 1	*	2870
HUDSPETH COUNTY—		
Rio Bravo Oil Co., S. P. Ry. Co., Fee 1	*	1385
PECOS COUNTY—		
Galt-Brown Co., Neville 1	*	1774
McCarty Oil Co., Gray 2	*	1395
Transcontinental Oil Co., University 1	*	4921
REAGAN COUNTY—		
Kemrow Co. & W. C. Beasley, Sawyer 1-A	*	2820

ANDREWS COUNTY—Deep Rock Oil Co. et al's A. R. King 1, sd for storage, td 4454 ft; B. L. King-Miles 1, elev 3196 ft, top salt 1700 ft, sd making water 4765 ft; W. J. Mathis 1, elev 3193 ft, top salt 1730 ft, co after shot, td 5088 ft. Fuhrman Pet. Corp.'s Ford 1, elev 3186 ft, fsh bit 4011 ft. Humble-Penn-Atlantic's H. M. Wilson 1, elev 3347 ft, top salt 1685 ft, top brown lime 4177 ft, dr 4560 ft. Martin-Maer & Kell's Meadors 1, dr 1220 ft.

BREWSTER COUNTY—Trans-Pecos O&G Co.'s Jones 1, elev 3073 ft, sd 2345 ft.

COKE COUNTY—Arkansas Fuel Oil Co.-Dixie Oil Co.'s Stepp 1, dr 3600 ft.

CONCHO COUNTY—Beasley et al's Waring 1, machine. A. W. Turner et al's Brisig 1, dr 1265 ft.

CRANE COUNTY—Cranfill & Gulf Prod. Co.'s Tubbs 1, elev 2526 ft, top salt 505 ft, top white lime 2445 ft, repairing engine after fire, td 3993 ft. C. C. Duffy et al's Cowden 1-C, rig. Sun Oil Co.'s State Bank 1, dr anhydrite 2700 ft.

CROCKETT COUNTY — California Co.'s Shannon 3, top salt 1105 ft, dr 2255 ft. Magnolia Pet. Co.'s Hoover 1, elev 2412 ft, top salt 660 ft, top lime 1890 ft, sd 5660 ft; Hoover 2, sp and sd.

CULBERSON COUNTY — Grisham-Hunter Corp.'s W. D. Garren 2, co 975 ft. W. L. Kornrumpf et al's Garren 1, co 850 ft.

ECTOR COUNTY — C. P. Davis et al's Hendrick 1, elev 2878 ft, top salt 1640 ft, sd 4012 ft. Penn Oil Co.'s Kloh 1, abn 1550 ft. Penn & Devonian Oil Co.'s Goodman 1, top salt 1690 ft, trace oil and gas, dr 4040 ft, top brown lime 3667 ft and white lime 3965 ft. Southern Crude Oil Pur. Co.'s Cowden 1, elev 3047 ft, dr 2950 ft. Sunray-Llano Oil Co.'s Jones 1, pb from 3823 to 3812 ft and shot. H. F. Wurtz et al's Ibbetson 1, elev 2840 ft, top salt 865 ft, sd 2375 ft.

EDWARDS COUNTY—Phillips Pet. Co.'s Holman 2, set cas 4120 ft.

FISHER COUNTY—Cranfill-Reynolds Co.'s Barrett 1, co 2645 ft; Flannigan 2, dr 2440 ft. Midwest Explo. Co.'s Decker 1, fsh cas 2880 ft. Roesser-Pendleton, Inc.'s, Steele 1, dr 2870 ft. The Texas Co.'s Teagarden 1-A, dr 2850 ft.

GAINES COUNTY — Humble O&R Co.'s Carswell 1, elev 3413 ft, top salt 1775 ft, dr 4415 ft.

GARZA COUNTY—H. C. Cate-Mel Richards' Stoker 1, elev 2591 ft, top salt 935 ft, top lime 2365 ft, sd 3035 ft.

GLASSCOCK COUNTY—Ed. Timberlake et al's Meek 1, elev 2575 ft, top lime 2670 ft, fsh 2965 ft. World Oil Co.'s McDowell 3-C, elev 2537 ft, co 660 ft.

TOM GREEN COUNTY—Mintex Oil Co.'s Campbell 1, set cas 475 ft. Phillips Pet. Co.'s Jennings-Gulden 1, fsh 3275 ft.

HOWARD COUNTY—Greene O&R Co. et al's L. C. Demna 1, lcn. Meriwether Oil Co.'s Smith 1, elev 2590 ft, dr 2850 ft. Owen-Sloan Oil Co. et al's Flowers 1, elev 2517 ft, sd hfw 3675 ft.

HUDSPETH COUNTY — California Co.'s University 1, elev 5109 ft, pb from 4848 to 4590 ft.

IRION COUNTY—Carl Cromwell et al's Tankersley 1, fsh 940 ft. Straughan & Texannati Oil Co.'s Nutt 3, dr 710 ft. F. E. Webb et al's Nutt 1, lcn. P. H. Williams et al's Ashe 1, sd 8900 ft; Noelke 1, sp.

JONES COUNTY—Gibson-Johnson's Hudspeth 1, sd 650 ft, oil in hole and show water 2542-75 ft. C. R. Pope et al's Swann 1, rig. Shaheen & Prairie O&G Co.'s King 1, dr 1990 ft.

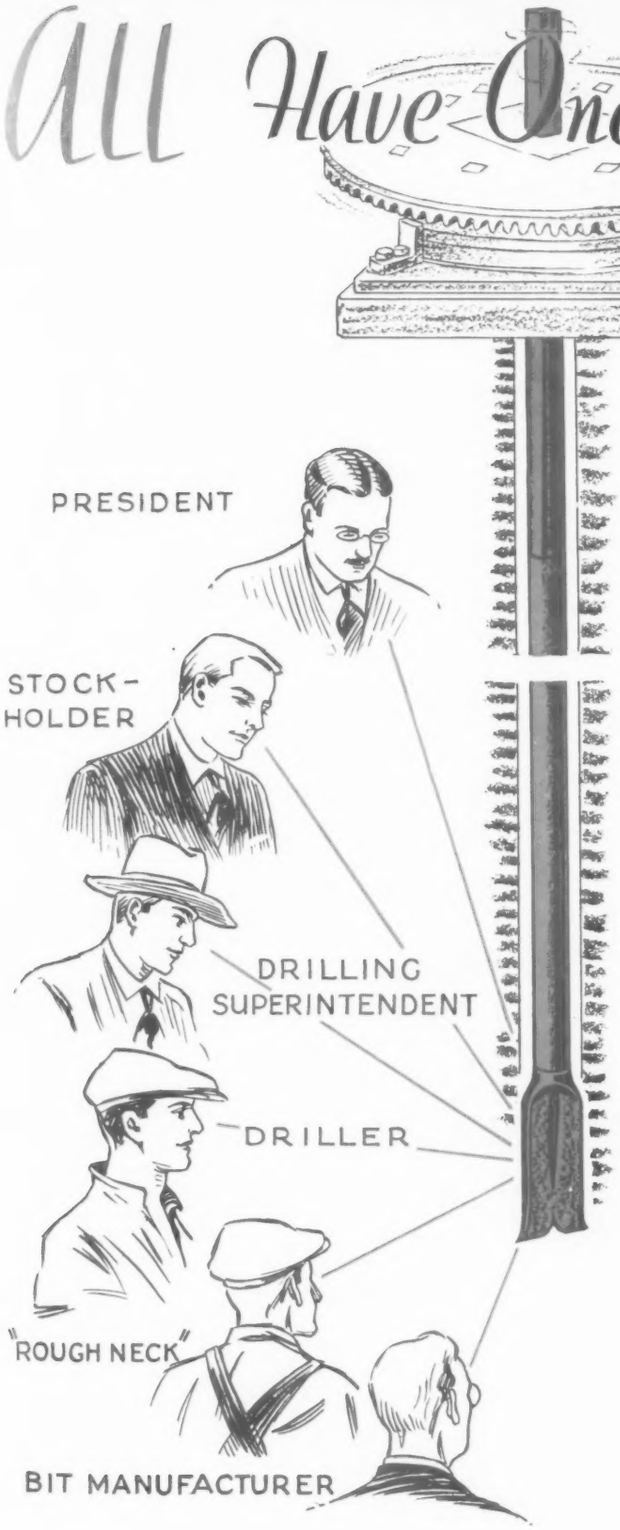
LOVING COUNTY—California Co.'s Reagan 2, top salt 735 ft, dr 1930 ft; Reagan 3, top salt 726 ft, dr 1170 ft; Reagan 4, dr 440 ft. Dixie Oil Co., Phillips Pet. Co.'s Johnson 1, elev 2819 ft, top salt 992 to 4130 ft, cem cas 4142 ft. A. R. Eppenauer Drlg. Co. & Young's Allen 1, sp. Geo. A. Henshaw et al's Reagan-McElvain 1, rig; Russell 2, top salt 755 to 4038 ft, top black lime 4227 ft, dr 4255 ft. L. E. Lockhart et al's Wheat-Ramsey 1, dr 2160 ft. Lockhart & Co.'s Bowen-Wells 3, sd 3385 ft; Hubbard 6, rig; Lepp 2, sp and sd. Miller-Burge-Healy's Chapman 1, set cas 700 ft. Joe Rush et al's Jim Wheat 1, cem cas 690 ft. Lee O. White et al's Russell 1, dr 420 ft.

LYNN COUNTY—Geo. McCamey-Hart Oil Corp.'s Edwards 1, sd 5210 ft.

MENARD COUNTY—W. C. Barnett et al's Callan 3, dr 1035 ft. Jas. L. Duffy & Panhandle Ref. Co.'s Eckhardt 2, show oil and gas 2943-72 ft and water 2972-77 ft. L. G. Priest et al's Sorrells 1, elev 2279 ft, fsh 2415 ft.

PECOS COUNTY—Barnes et al's Sanford 1, dr 385 ft. Black-Doran & McGee's Pecos Valley 1, sd 1215 ft. California Co.'s E. J. Fromme 1, dr 1650 ft. E. L. Chapman et al's Streety 1, elev 2653 ft, sd 2200 ft. Crosby

All Have One INTEREST In Common!



IN oil well drilling, everyone's attention is focused intensively upon the performance of the bit in the hole —in keeping it on bottom and getting the well on production. The well is merely an expense until producing, so it is important to get it on production as soon as possible.

It is imperative, therefore, that manufacturers supply, and oil companies use, drilling bits that make hole fast and economically.

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Los Angeles, California, U.S.A.

TITAN

Prod. & Ref. Co.'s Cordova 1, elev 2320 ft, top salt 725 ft, sd 2080 ft. Humble O&R Co.'s Kokernot 1, elev 3595 ft, dr 2105 ft; Thompson 1, dr 425 ft. Hussman Oil Co.'s Estes 1, sd 1680 ft. Independent O&G Co.'s McDonald 4, dr 1440 ft. Independent & Buell-Hagan's Pecos Valley 1-A, sd spraying three bbls oil and 16 mil ft gas 1545-1623 ft. Magnolia Pet. Co.'s L. L. Byrne 1, dr 65 ft. Messenger et al's Butz 1, sd 740 ft; Byrne 2, sd 1367 ft. J. R. Miller et al's Bennett 1, sd hfw 1650-1700 ft. J. D. O'Mara et al's Bennett 1, sd 1230 ft. Oregon Oil Corp. et al's Yates 2, elev 2565 ft, top salt 710 ft, fsh cas 1953 ft. O. J. Perren et al's Eaton 2, sd 1323 ft; Jackson-Pure 1, sd 1399 ft. R. W. Porpus et al's State 1, sp and sd. Pure Oil Co.'s Harrison 1, dr 1133 ft. Sides & Cloyd's Blackstone-Slaughter 1, top salt 860 ft, sd 2065 ft. W. F. Walsh et al's Henderson 1, elev 3325 ft, sd hfw 2885-87 ft. Rio Grande Oil Co.'s Webb 1, dk. R. D. Webb et al's 3, sd 466 ft.

PRESIDIO—Brite Prod. Co.'s L. C. Brite 4, elev 4536 ft, sd 2630 ft.

REAGAN COUNTY—Big Lake Oil Co.'s University 3-C, washing hole in sandy lime 8816 ft; University 4-C, fsh line and tools, td 8220 ft; University 5-C, changing to rotary outfit, td 2400 ft; University 179, reaming hole 4003 ft.

REEVES COUNTY—California Co.'s Kloh 1, dr 2885 ft. May & Miller's J. B. Ellis 1, dr 695 ft. Salsbury & Gregory's Bell 1, sd 260 ft. Slack & Fink's Brooks-Huling 1, elev 3116 ft, sd 1860 ft. Lee O. White et al's Mrs. Lizzie Hersheusen 1, dr 3845 ft.

RUNNELS COUNTY — Boyce & Lamar's Lange 1, elev 1844 ft, sd 2643 ft. Chas. Dutton et al's G. W. Dean 1, dr 1105 ft.

SCHLEICHER COUNTY—Delmar Oil Co.'s O'Harrow 1, ur 4060 ft. Phillips Pet. Co.'s J. A. Whitten 1, elev 2333 ft, pb from salt water 6880 ft to test show oil 6300-37 ft. Munger-Wilson Oil Co.'s Page 1, elev 2270 ft, fsh 4912 ft. Paul Teas & Walter Gant's Allison 1, cem cas 2395 ft. J. D. Wesner et al's Nicks-Rathff 1, sd 756 ft. Westyde Inv. Co. &Moody Oil Corp.'s C. L. Meador 1, lcn.

SCURRY COUNTY—J. G. Armand & Camp Springs O&R Co.'s Strayhorn 1, sd 470 ft; Quinn 1-A, elev 2316 ft, sd 4374 ft. D. H. Byrd & Harmon's Murphy 1, elev 2298 ft, fsh 3320 ft. Pender O&G Co.'s Davis 1, dr 4715 ft. Transcontinental-Vacuum Oil Co.'s Peckham 1, elev 2155 ft, dr 3130 ft.

STERLING COUNTY—Fred Turner-Mann-Wohlford's Reed 1, dr 1925 ft.

TAYLOR COUNTY—W. G. Clark & Humble O&R Co.'s Kendall 1, sd 1310 ft. Eastland Oil Co. et al's Hunter 1, sp. Gibson-Johnson et al's Bingham 1, bad hole 2412 ft. H. D. Herring-Hucony Gas Co. et al's Richie 1, sd 1080 ft. J. B. Jameson et al's Webb 1, elev 1905 ft, sd 6001 ft. Sanger et al's City of Abilene 1, rig.

TERRELL COUNTY—Big Bend Oil Corp. et al's Bassett 1, sd 2130 ft. Transcontinental Oil Co.'s Good 1, elev 2405 ft, sd 5202 ft.

TERRY COUNTY — Penn Oil Co. Unit Plan's P. Carlisle 1, elev 3275 ft, top salt 2260 ft, dr 5000 ft.

VAL VERDE COUNTY—O. O. Owens et al's Mills 1, sd 6400 ft. Phantom Oil Co.'s Ingram 1, sd 3110 ft.

WARD COUNTY — Atlantic & California Co.'s E. W. Thomas 1, rig. Atlantic & Penn Oil Co.'s Bennett 1-B, fsh 2210 ft. Bradford et al's M. B. Murry 1, dr 160 ft. Gulf Prod. Co.'s Hutchings 4, making 20 million ft gas 2415-55 ft; Hutchings 5, dr 600 ft; O'Brien 9, elev 2655 ft, top salt 1025 ft, flowed 215 bbls oil and some water 2572-2684 ft after pb from 2688 ft, O'Brien 10, top lime 2375 ft, swab 35 bbls oil 2662-70 ft; O'Brien 11, top lime 2380 ft, flowed 72 bbls oil 2665 ft; O'Brien 12, top lime 2325 ft, flowed 92 bbls oil 2650 ft. Magnolia Pet. Co.'s Geo. Sealy 1, dr 425 ft. R. F. Owen et al's Johnson 1, sd 600 ft. Sid Richardson et al's O'Brien 4, rig. Shipley Oil Corp.'s Monrie 1-A, dr 1750 ft. J. E. Smith et al's Clements 1, elev 2439 ft, top salt 745 ft, sd 2230 ft.

WINKLER COUNTY — Atlantic & Simms Oil Co.'s Sealy 1, dr 1800 ft. Atlantic & Joe Maxwell's L. Daugherty 1, cem cas 400 ft. Champion-Winkler Oil Corp.'s Campbell 1, dr 4080 ft. Jeffrey et al's Brown 2, sd 3120 ft. Magnolia Pet. Co.'s Scarborough 3, lcn.

EAST TEXAS

Completions

Company, Well and Location	Production Bbls.	Depth
SHELBY COUNTY—		
Loring Oil Co.'s McCann 1, D. G. Green Sur.	*	5520

CASS COUNTY—Phillips Pet. Co.'s Olds 1, J. A. Stephenson Sur rgn up.

HARRISON COUNTY — Shell Rock Pet. Co.'s Daugherty 1, fsg junk 3445 ft.

MARION COUNTY—W. D. Chew's Fee 1, Hamilton Sur drlg sh 2400 ft. P. E. Hussey et al's Trammell 1, Chas. Lockhart Sur drlg sh 805 ft.

PANOLA COUNTY—Knott et al's Marion Durham 1, Chas. Haley Sur s. d. 2005 ft.

SABINE COUNTY—Loring Oil Co.'s Nona Mills Lbr. Co. 1, Mason Sur, dk.

SHELBY COUNTY — Chapparall Oil Co.'s Holt 2, Matthew Moore Sur s. d. 3300 ft.

SOUTH TEXAS

ATASCOSA COUNTY — American Central O&G Co.'s McConnel 2, WMC Baker sur, td 400 ft, to re-dr. Blue Bonnet Pet. Co.'s E. W. Tutschkke 14, W. Farquhar sur, loc. Frontier Oil Co.'s Boynton 2, John Sharp sur, sp in. Nute Walker and Derden's J. B. Young 1, Wm. Moore sur, no report.

BASTROP COUNTY—Pacific O&G Co.'s J. M. Litton 1, 150 ft from n and w lines, permit granted.

BEXAR COUNTY—Bolling and Michael's J. P. Adam 1, M. Gotaire sur, td ft. Eckert and Son's Sandemer 7, Menchaca sur, lcn. KMS Pet. Co.'s E. Salicky 1, Mission Garden sur, lcn. Moore and Juar's Ellison 1, 14 mi w of San Antonio, td 2110 ft, csg set top of sand to test, no further report. W. M. Morgan et al's Bloodgood 1, Villa Perido sur, td 700 ft, sd. McElreath and Sugget's Stephens 1, P. Hays sur, td 1480 ft, dr. Penn-Tex Oil Co.'s Sandemer 3, Menchaca sur, lcn. J. Morgan Russell's Mills 1, Angel Navarro sur, td 735 ft, mv on rotary; Strong 1, A. Navarro sur, td 200 ft, sd. Swearingen Oil Co.'s Fee 6, 600 ft s and w of No. 1, td 450 ft, dr. Henry Yelvington s (formerly Swift and Fischer) Beck 1, P. W. Hays sur, td 1400 ft, sd at present.

BEE COUNTY—Arkansas Natural Gas Co.'s Kimball 1, Stephen Winship sur, td 327 ft, set 10-inch csg. Buchanan's (formerly Weinert) Townsite 1, Blk. 38, td 3920 ft, top of pay 3915 ft, setting 6⅝-inch csg. Batex Prod. Co.'s Barnett Heirs 1, John Pace sur, td 3645 ft, prod 102½ bbls and 15,000,000 cubic ft of gas, csg set 3629 ft, lins 31-34, main cap 34-35. Cosden Oil Co.'s McKinney 2, John Pace sur, td 3682 ft, top of pay 3670 ft, cored 12 ft sand, csg set 3628 ft, ru Christmas tree; McKinney 3, 500 ft w of No. 1, td 3660 ft, being completed, csg set 3648 ft, dst 3648-55 ft, show oil and mud, lins 51-54, cap 54-55 ft. Getty Oil Co.'s Townsite 1, Blk. 40, td 1175 ft, dr in shale. Glasscock Bros.' Pettus Town 2, Blk. 20, td 1750 ft, dr in shale. Grayburg Oil Co.'s Kimball 2, e of new producer, td 2300 ft, dr in gumbo; Copeland 1, w of producer, td 1[illegible] ft, dr. Humble O&R Co.'s McKinney 5, [illegible] offset to Houston-Beasley-Town well, td 21[illegible] ft, dr in shale. Houston Oil Co.'s Newman 1, G. A. Kerr sur, td 3698 ft, prod 300 bbls, csg set 3675 ft; Pettus Town 2, Blk. 21, lcn; Pettus Town 3, Blk. 23, ru; Pettus Town 4, Blk. 33, td 330 ft, set 10-inch csg; Pettus Town 5, Blk. 35, td 480 ft, set 10-inch csg. Geo. A. Henshaw et al's Beck 1, 1 mi ne of Hicksgasser, td 4200 ft, showed ft oil sand at 419[illegible] 95 ft, water sand to 4200 ft. Independent O&G Co. & Moody-Seagraves Prod. Co.'s Quincy 1, A. & J. Moyah sur, lcn. Edwins Jones' Rapp 1, Uranga sur, td 6062 ft, plugged back to gas sand at 3094-3118 ft. Lange and Mimms' Billingsley 1, Grayburg-Kimball area, td 380 ft, sd. Nichols et al's Hicks 4, Jose Maria Uranga sur, td 3842 ft, coring. Osage Oil Co.'s A. J. Mauldin 1, Pointevent sur, loc. Hick & Young's (formerly Gene Patton et al) Billingsley 1, B. Q. Hadley sur, sp and sd, to re-dr. Ed Price's Weiss 1, 2640 ft out of n corner of tract, td 4300 ft, standing. Rio Bravo Oil Co.'s SAAP 2, Kerr sur, townsite, lcn; SAAP 3, 390 ft n of No. 3, permit granted; SAAP 5, [illegible] of No. 40, permit granted; SAAP 6, 326 ft [illegible] of No. 5, permit granted; SAAP 7, 544 ft n of No. 6, td 3890 ft, cap rock 3888 ft, coring; SAAP 8, 435 ft n of No. 7, permit granted; SAAP 9, 435 ft n of No. 8, permit granted; SAAP 10, 200 ft from w line and 140 ft from s line, permit granted; SAAP 11, 140 ft from s and 150 ft from ne line, permit granted; SAAP 12, 70 ft from w line and 200 ft from s line, permit granted; SAAP 13, 700 ft s of No. 14, permit granted; SAAP 15, 750 ft n of No. 14, permit granted; SAAP 16, 871 ft n of No. 15, permit granted. Swift et al's Mauldine 1, J. Pintecant sur, td 190 ft, sd. T. B. Slick's Townsite 1, (Hodges and Mary E. Mitchell) Blk. 37, td 3905 ft, set 6⅝-inch csg at 3897 ft, wait on cement, sand 3897-3903 ft; Alfred Theis 1, 1 mi ne of Gadiz, dr water well. Townsite 2, Blk. 19, td 334 ft, set 10-inch csg; Townsite 3, Blk. 31, ru. Simms Oil Co.'s Holzmark 1, James A. York sur, td 650 ft, set 12½-inch csg. Southern Crude Oil Co.'s Dahl 1, Mana Dahl tract, td 3760 ft, dr. Texas Co.'s Scott 2, J. M. Urango sur, loc. Union Prod. Co.'s Ray 10, R. G. Millican sur, td 2550 ft, dr; Ray 13, Geo. Hamer sur, td 2550 ft, dr; Ray 15, e offset to Beasley, td 3918 ft, top of pay 3411 ft, set 6⅝-inch csg at 3910 ft; Ray 16, Pettus Townsite, td 3852 ft, top of pay 3498 ft, set csg 3948 ft; Ray 17, ¾ mi s of old No. 3, in R. G. Millican sur, loc; Ray 18, offset to Blk. 38 townsite, loc; Ray 19, offset to Blk. 37, townsite, loc; Ray 20, e offset Humble McKinney 5, loc; Ray 21, offset to Blk. 40 townsite, loc; Ray 22, offset to Blk. 39 townsite, loc. Wilson and Hill's Townsite 1, center of Blk. 14, loc; Townsite 2, center of Blk. 16, loc.

BLANCO COUNTY—B. J. Meeks and Anderson's E. W. Walker 1, 4 mi n of Blanco City, td abt 275 ft, dr. Adams and Lysle's Leeders 1, 5 mi nw of Blanco City, no report. C. L. McCreary's Miers 1, Scherling subdivision, td 100 ft, dr. H. Sitton's McMillen 1, 2 mi w of Blanco, td 150 ft, dr.

BROOKS COUNTY — Houston Oil Co.'s Wormser-Holbein 2, Palo Blanco de Manguellos grant, td 2792 ft, dr. Humble O&R Co.'s Singer 2, 1 mi s of Lasater field, td 4412 ft, set 9⅝-inch csg. Southern Crude Oil Purchasing Co.'s Holbein-Wormser 1, 4 mi s of production in Lasater field, dk.

CALDWELL COUNTY — Humble O&R Co.'s New 5, td 2210 ft, pumping 175 bbls, csg set at 2205 ft on crevice; Gray 12, J. Hinds sur, td 2400 ft, dr. W. E. Allan's McKean 2, 300 ft w of No. 1 in 400 acre tract, ru. Herb Morgan's Perry 2, ½ mi n of Humble-New gusher, to mv on. Al Buchana's Brown 2, C. M. Cannon sur, td 40 ft, surface pipe set and sd.

COMAL COUNTY—Caldwell and Lanier's Byler 1, 6 mi s of Blanco City, td abt 150 ft, dr.

DUVAL COUNTY — Callahan, Howard & Smith's Luby 1, survey 24, td 3610 ft, dr. Humble O&R Co.'s Koehler 47, td 1767 ft, prod. 10 bbls, csg set 1756 ft. Henne & Winch's (W. E. May) Benavides 1, M. Arispe sur, td 2818 ft, tested gas and salt water. Larco

New Wells Started In California

HUNTINGTON BEACH — Standard Oil Co.'s Thomsen 13, 12-6-11. Rex Oil Co. No. 16, 2-6-11.

LONG BEACH—Signal O&G Co.'s Signal-Goodyear 3, 29-4-12. Golden Gate Oil Co., Ltd., No. 1, 18-4-12. Pet. Securities Co.'s Painted Hills 3, 29-4-12; Kale 1, 29-4-12. McKeen Oil Co. No. 8, 29-4-12; No. 9, 29-4-12. Stevenson Bros. No. 1, 28-4-12.

LOST HILLS—Geo. F. Getty, Inc., Lincoln Drilling 1, 12-26-20.

PLAYA DEL REY—A. T. Jergins' Trust Meyers 1, 21-2-15. W. A. Cory & Robt. A. Randall No. 1, 21-2-15. Union Oil Co.'s Townsite 1, 28-2-15; Townsite 2, 28-2-15. Bishop Corp.'s Venice 1, 21-2-15.

PIRU—Bolsa Chica Oil Corp.'s Snow 1A, 4-4-18.

POTRERO — Inter-Coast Oil & Transport Co. Ltd. G. P. 2, 28-2-14.

RINCON—Richfield Oil Co.'s Miley-Hobson 4, 8-3-24.

ROUND MOUNTAIN—C. C. M. O. Co. No. 1, 6-28-29. Shell Oil Co.'s Jewett 13, 29-28-29.

TULARE COUNTY—Allen F. Bullard No. 1, 35-22-27.

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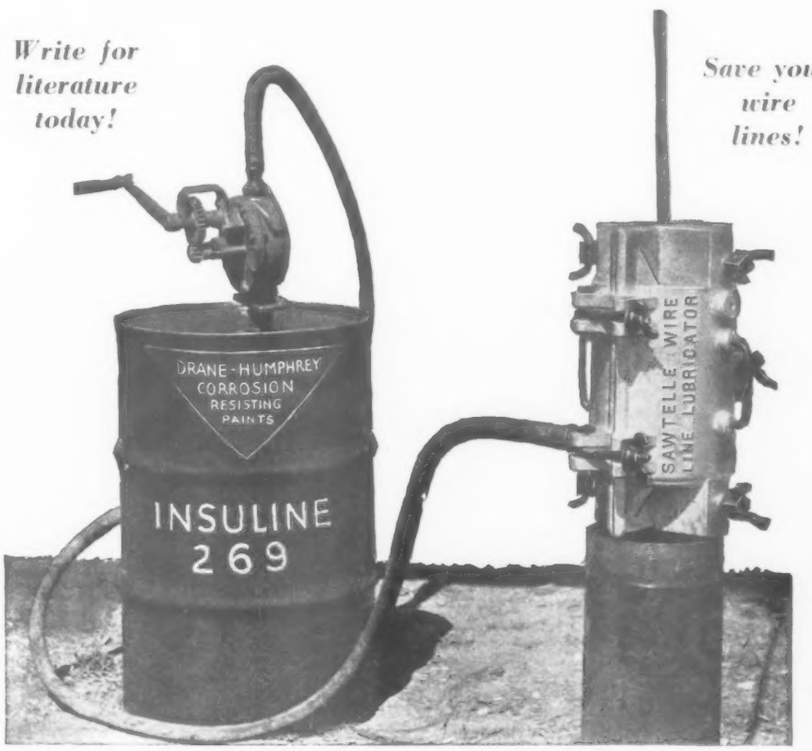

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Gas & Pet. Co.'s Balck-Beall 1, 400 acre blk in nw part of county, loc. Mag. Pet. Co.'s Lundell 1, td 5335 ft, dr; Schoolfield & O'Byrne 1, td 4765 ft, dr; Hahl 1, Pointevant sur, loc; Hahl-Norton 1, loc. Putnam & Walsh's Hagdist 1, sur 2694, td 2200 ft, dr. Sal O&G Co.'s Welder-Woods 2, survey 215, td 1600 ft, dr. South Texas Prod. Co.'s Peters 1, survey 398, ru. M. I. Shaw's Benavides 2, survey 173, td 600 ft, dr.

FAYETTE COUNTY—Heffer-Stanton's M. E. Manton 1, 2 mi nw of La Grange, no report. Kelly et al's Mirks 1, td 1700 ft, dr. Moore et al's Kerr 1, td 2000 ft, side tracking at last report.

GONZALES COUNTY — Lake & Thompson's Campbell 1, Saturn area, no report. Linden Pet. Co.'s Hensley 1, James Smith sur, td about 200 ft, dr. Sterne & Terrell's F. Ramzinsky 1, prep to sp. John Mauldin's (Finnell and Elam) Robinson 1, td below 3000 ft, dr. United North & South Dev. Co.'s Preston 2, 900 ft e and s of No. 1, sp in.

GOLIAD COUNTY—H. E. Hewitt's Geo. Ray 1, td 4091 ft, standing. A. G. Rheimenschneider's, Trustee, A. T. Fromme 1, Peter Dexter sur, td 1665 ft, show of gas 1658-65 ft. Union Prod. Co.'s Ray 12, W. E. Sutherland sur, td 3890 ft, dr.

GUADALUPE COUNTY—AMH Oil Co.'s F. S. Bibbs 1, J. W. Robinson sur, lcn. Cranfill-Reynolds' J. McIntyre 1, A. Gibson sur, ru. Adams & Lyles' Nitsch 1, Zoboroski area, sp in. Humble O&R Co.'s Baker 7, td 2100 ft, dr. Texas Co.'s Knoblock 8-B, offset to Magnolia Knodle 2, td 2540 ft, set csg. Louis Neis' Otto Vosges 1, Josefa Leal sur, lcn. Gulf's Molear 2, no report; Dix McKean 9, no report; Dix McKean 4-A, dr. Hines, Brown and Davenport's Atzger 1, td 2200 ft, dr. Ray Oil Co.'s R. Felsing 1, M. Baker sur, permit granted.

JIM HOGG COUNTY—Pippin & Mussey's N. Hinnant 1, sur. 300, dk.

KARNES COUNTY—Morrissey & Edminston's T. H. Ragsdale 1, John McCall sur, td 1365 ft, sd.

KENDALL COUNTY—Borget et al's Wallie Haag 1, td 940 ft, sd. C. R. Dutton's Lawhorn 1, J. Lawhorn Sec. 10, td 485 ft, dr. Dixon et al's Behr 1, 3 mi se Sisterdale, td 1935 ft, dr. Molwinkle et al's Karsten 1, sur 724, td 925 ft, dr. P. S. Sterling's McCrocklin 1, C. B. Owen sur, td 850 ft, dr. W. B. Sitton's Garvin 1, td 775 ft, fsh.

KERR COUNTY—James Dalgish et al's Sid Peterson 1, Warner ranch, contract signed for test. Mashe & Trunstill's Jeff Love 1, sur 1594, td 650 ft, dr.

KINNEY COUNTY—Blume et al's Herbst 2, Poindexter Burns sur, td 300 ft, sd. Mag. Pet. Co.'s Wardlow 1, Blaez sur, td 2700 ft, dr.

LIVE OAK COUNTY—Houston Oil Co.'s Booth 1, td 5257 ft, install heavy rig to run pipe, dst 5252-57 ft, 300 ft 48 gravity oil in 12 minutes; Cartwright 22, td 3388 ft, dr. Larco Gas & Pet. Co.'s Wallace D. Wade 1, 5 mi n and e of Sandaria, loc.

MEDINA COUNTY—Calco Pet. Co.'s Crawford 1, sur 478, td 905 ft, dr; Donaldson 1, sur 25, td 170 ft, dr. Natl. Oil Co.'s Howard 1, 6 mi nw Devine, td 1645 ft, set 6⅝-inch csg at 1610 ft on top of sand, cored saturated sand 35 ft. Pan-American Dev. Co.'s Hardt 1, td 1800 ft, csg set 1170 ft, sd. Sun Oil Co.'s Wm. Edgar 1, S. Buell sur, td 1280 ft, dr in Del Rio. Sunflower Oil Co.'s Mofield 1, J. Brothag sur, td 945 ft, csg set 882 ft, wo shewing oil, sand, water and gas. Witherspoon Oil Co.'s Adams 1, (Adams Gas Field) td 222 ft, sd Edwards topped at 2080 ft, formation dry.

McMULLEN COUNTY—N. Coquat's Wm. Fahler 1, Geo. Pickett sur, td 1950 ft, dr.

MAVERICK COUNTY — Rycade Oil Co.'s Chittim 5, Sec. 129, td 4250 ft, dr; Sullivan 5, Sec. 82, td 6625 ft, dr; Chittim 6, Sec. 416, td 3240 ft, dr.

NUECES COUNTY — Grimm & Yakey's Land Ranch 1, 7½ mi ne of Agua Dulce field, loc. Houston Oil Co.'s M. E. Brooks 1, Agua Dulce field, Benton Pasture Subdivision, td 4800 ft, in lime and shale, prep to make dst. Independent O&G Co.'s C. Russell Farms 1, 2½ mi w of Corpus Christi, dk. Saxet Oil & Gas Co.'s (Pearson et al) Donigan 2, 6 mi w of Corpus Christi, loc; Dunn 6, td 3500 ft, re-dr after installing heavy rig. R. A. Thomson, Trustee, Lawrence-Harral 2, 8 mi w of Corpus Christi, sp in. South Texas Prod. Co.'s Danderman 1, Agua Dulce field, td 4000 ft, temporarily sd.

SAN PATRICIO COUNTY—Cosden Oil Co. et al's John Schmalsteig 1, G. H. Paul sur, td 1200 ft, set 10-inch csg; 12-inch csg set 400 ft. Jacob, Bussini & Pickett's J. C. and Bobby Baldwin 1, ½ mi e of Sinton, td below 4000 ft. J. L. Kennedy's Lolie McRae 1, 3½ mi se of Houston-Boothe well, loc. Peterman Oil Co.'s O. K. Crow 1, 2 mi s Sinton, ru. Saxet Oil Co.'s Carroll 1, Taft subdivision, ru. Union Prod. Co.'s Welder 4, E. Portillo sur, dk.

STARR COUNTY—Kusk Exploration Co.'s Kelsey 1, J. B. Villareal sur, td 500 ft, dr. L. V. McLean's 1, Porcion 81, loc. Mrs. J. L. Smith's Welch 1, td 1000 ft, dr.

UVALDE COUNTY — Phanton Oil Co.'s Caludt 1, survey 661, td 2250 ft, set 8¼-inch csg.

VAL VERDE COUNTY—Phanton Oil Co.'s Ingram 1, survey 44, td 3110 ft, sd.

VICTORIA COUNTY—Atte Drlg. Co.'s J. C. West 1, td abt 1800 ft, dr. Lion O&R Co.'s McFadden 2, M. Trevino sur, td 1900 ft, dr in shale. Houston Oil Co.'s McFadden 1, C. L. Mann sur, loc. The Texas Co.'s McFadden 1, Hannibal Bonney sur, td 1200 ft, dr, csg set at 1087 ft.

WEBB COUNTY—E. H. Buckner's Benavides 1-A, Sec. 14, Blk. 5, Arispe Grant, dk; Elliott 1, Sec. 315, loc. J. L. Elliott's Esperanza Land and Livestock Co. 2, 12 mi w of Encinal, td 1000 ft, dr. French Oil Co.'s Benavides 3, td 50 ft, dr. O. W. Killam's Bruni 19, loc; Bruni 12, Blk. 22, td 3100 ft, dr; Bruni 1, Sec. 1 of Billings Ranch, td 1800 ft, dr; Webster 6, Survey 684, td 2600 ft, producer; Bruni 5, td 2835 ft, prod 1,000,000 cubic ft of gas spraying oil, csg set 2847 ft; Bruni 2, Blk. 33, td 2841 ft, csg set 2841 ft. Mag. Pet. Co.'s Wright 1, survey 674, ru; Benavides 4-A, td 52 ft, dr; Jones 1, survey 674, ru. Geo. S. Marshall's Garcia 2, dk. South Texas Prod. Co.'s S. Benavides 1, s Section of Cole field, td 800 ft, dr; S. Benavides 2, 250 ft from nw and 150 ft from sw line of Blk. 24, Arispe Grant, td 2700 ft, dr. Washington-Texas O&G Co.'s R. O. Benavides 1, Blk. 16, Sec. 268, ru.

WILSON COUNTY—Transcontinental Oil Co. et al's Bain 1, Neal F. Roberts sur, td 4560 ft, showed sulphur water in Edwards.

ZAVALLA COUNTY — Anglin O&G Co.'s Pryor 5, td 1103 ft, to plug back to 425 ft to complete as gasser. Cromwell et al's Whitecotton 1, dk. Cribbs and Davidson's Weatherby 1, near Loma Vista, td 1750 ft, dr top of mid-way, formations running high; Ike Pryor Jr. 2, 750 ft se of No. 1, loc. Texas Gas Fuel Co.'s West 7, td below 1500 ft, dr. Weigand Bros.' Gates 1, td 2350 ft, complete fsh job, re-dr.

ZAPATA COUNTY—Allied Gas Co.'s Trevino 7-A, td 1244 ft, prod 100 bbls, csg set 1234 ft; Trevino 8-A, td 1247 ft, prod 75 bbls, csg set 1233 ft; Trevino 9-A, dk; Trevino 10-A, td 1224, ft, flowing 30 bbls a head, csg set 1214 ft. Arnold & Ahler's (Wicker et al) Garza 2, Comita grant, td 1356 ft, set csg. Alamo Drlg. & Leasing Co.'s Trevino 3, Blair lease, oil well but no information obtainable; Trevino 4, Blair lease, td 300 ft, dr; Trevino 3, Claggett lease, td 1220 ft, csg set; Trevino 4, Claggett lease, td 300 ft, dr. Blankenship et al's Montemayor 2, td 1271 ft, csg set, prep to dr in. Edginton & Niles' Trevino 5, Blk. 26, Sec. 412, td 1235 ft, prod 330 bbls, csg set 1219 ft; Trevino 2-B, td 1247 ft, prod 20,000,000 cubic ft of gas, csg set 1219 ft; Trevino 6, td 1235 ft, csg set 1216 ft, standing full of oil, prep to run tubing; Trevino 4-B, ru; Trevino 5-B, lcn. Kenne & Jackson's Garza 1, td not available, dr. Grimm & Yakey's C. Bustamente 1, s end Muckeleroy field, td 1332 ft, stem test 1332 ft; Trevino 1, n part of Muckleroy field, dk; C. Bustamente 2, lcn; Bustamente 1, Comitas grant, lcn; Bustamente 1-S, lcn. South Texas Prod. Co.'s F. Martinez 1, Survey 6, td 1651 ft. Henne & Winch's Jose Bustamente 1, td 1285 ft, dr; Bustamente 2, lcn. O. W. Killam's Cuellar 17-B, td 1000 ft, dr; Cuellar 18, sd 2645 ft; Cuellar 22-B, dr 950 ft; Cuellar 23-C, td 1568 ft, set csg; Martinez 1-A, Survey 120, td 2500 ft, dr; Martinez 2, Sec. 75, td 1447 ft, dr. B. F. Nixon's Guiterrez 1, (Partition No. 10 Borrego Grant) td 50 ft, re-dr. Palm City Oil Co.'s M. Guiterrez 4, C. Redondo sur, loc. Nordan & Morris' Trevino 5-A, csg set 1240 ft; E. Guiterrez 2, loc; Trevino 2-A, Blk. 6, loc; Trevino 1, Acklen lease, td 1000 ft, dr; Trevino 4-A, csg set 1334 ft; DeLa Santos 1, td 500 ft, dr. John Pappas, Inc.'s, Flores 1, Porcion 350, dk. Penny Pet. 250 ft, dr. Penn Tex Oil Co.'s F. Benavides 3, ru, laying water line. Slick et al's Escobas Ranch 2, dr; Escobas Ranch 3, no report. W. R. Shankle's Trevino 3, loc; Cuellar 3, td 1274 ft, csg set. SRC Corporation's Cuellar 6-B, td 1244 ft, prod 65 bbls, csg set 1231 ft; Cuellar 7-B, td 1238 ft, prod 40,000,000 cubic ft of gas, csg set 1228 ft; Cuellar 8-B, td 1248 ft, prod 70 bbls, csg set 1238 ft; Cuellar 9-B, ru; Cuellar 10-B, ru; Cuellar 5-B, dk; Trevino 5-B, td 1261 ft, dr; Trevino 3-A, td 1237 ft, csg set. South Texas Prod. Co.'s Martinez 2, Survey 6, td 1878 ft, prod 20,000,000 cubic ft of gas, csg set 1864 ft; Benavides 2, near Bruni City, td 2700 ft, dr. Trinity Driller's Cuellar 1, Sec. 65, ru; Trevino 2, Sec. 66, loc. Zachry et al's 1, 1½ mi s and w of National No. 1 Adams, loc.

TEXAS GULF COAST

Completions

Company, Well and Location	Production Bbls.	Depth
LIBERTY COUNTY—		
Gulf Prod. Co., Boyt 7, Hankamer..	400	4100
BRAZORIA COUNTY—		
Shell Pet. Co., Blakely-Winston 3, Danbury	*	1619

AUSTIN COUNTY—J. T. O'Hara et al's Batla 1, 8 mi nw Raccoon City, st at 4000 ft.

BRAZORIA COUNTY—Thos. Faust et al's Fee 6, 2 mi s Nash Dome, 4369 ft gas show. Shell's Blakely-Winston 3, Danbury, abn. Rycade and Amerada's Rapid City 1, 2 mi s Danbury, 5722 ft gumbo. Rycade's Wisdom 27, Nash, set 13⅜-inch casing, woc. Rycade & Vacuum's Wisdom 1, Lake Jackson, lcn. Rycade & Amerada's Seaburn 1, Stratton Ridge, ru. Freeport Sulphur Co.'s Fee 2001, Bryan Mound, 1790 ft gumbo. Ruck's and Patterson's Hunter 1, sw Hoskins Mound, sd at 1180 ft. The Texas Co.'s Ewing 1, 1½ mi n Manvel, 5960 ft in sand. Mills Bennett's Reese 1, Allen dome, 1790 ft oil show; Poole 1, ru. United Syndicate's Mores 1, 3 mi n Danbury, 1452 ft shale.

CALHOUN COUNTY — The Texas Co.'s Thomas 1, Chocolate Creek district, 6 mi w Port Lavaca, 2820 ft gubo and li.

CHAMBERS COUNTY — Pure's Mayes 11, Lost Lake, 2675 ft coring; Mayes 11-A, dk. Lost Lake 5, 878 ft gbo. Pure's Kirby 1, Cove, 6615 ft sandy shale. Pure-Rycade's Jackson 1, Oyster Bayou, 6 mi w High Island, 5977 ft fsh. Superior Oil Co.'s H. Jackson 1, 5 mi w High Island, changing rigs. The Texas Co.'s Jackson 1, Salt Cedars, 2965 ft gbo and li. Chicago Oil Corp.'s Lawrence 1, 10 mi s Barbers Hill, sd.

COLORADO COUNTY—Gulf, Humble & Penn's Hugh Wilson 1, ½ mi e Alleyton, 4185 ft in sandy shale, gas show.

GRIMES COUNTY — Cranfill - Reynolds' Stoneham 1, 8 mi se Navasota, dr 2855 ft shale. Deering & Nobleman's Templeman 1, 6 mi s Navasota, 1870 ft in shale.

HARDIN COUNTY—D. O. Speight's Gidrey 1, 4 mi s Batson, 2485 ft in gumbo.

HARRIS COUNTY—Humble's Simms-Smith 78, Goose Creek, 2810 ft sand and rock. Humble's Warren 7, Hockley, lcn; Minnetex 3, Mykawa, set csg 1345 ft, woc. Mrs. J. C. Baldwin's Kitzman 1, 2 mi n Cypress, sd at 4247 ft.

JACKSON COUNTY — The Texas Co.'s Mitchell 1, Lolita, 12 mi s Edna, 5756 ft in sh. Jackson Co. Oil Syndicate's Drushell 8, Edna, dr st test at 3218 ft, show gas and sw.

JEFFERSON COUNTY — Westbury Oil Co.'s West 1, S. Choate sur, 3498 ft in gbo. Gulf's Junker A-2, Fannett, 4238 ft in sand. The Texas Co.'s Pipkin 3, Big Hill, 1675 ft anhydrite.

LIBERTY COUNTY — Humble's Sabine Tram 1, Devers, 5800 ft in sand and shale, tearing down rig. Houtex Prod. Co.'s Deering-Wilhite 2, N. Dayton, 5554 ft dr in shale. Mattie R. Davis 1, N. Dayton, sp in 7-23-38. Gulf's Boyt 7, Hankamer, 4100 ft in shale, completed for 400 bbl producer at 4100 ft; Boyt 8, 4245 ft in sand; Ezzell 1, Hankamer, 2668 ft in sand. Cranfill-Reynolds Co.'s Vajdak 1, e side Esperson, prep to drill deeper; Moore's Bluff B-1, 2 mi se Esperson Field, dr 1653 ft

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POMONA PUMPS are not affected to a great degree by the natural changes in water levels or varying conditions of the well. Our product is designed so it can be adjusted from time to time to maintain maximum efficiency over a long period. More runners may be added or shafting lengthened at a minimum cost. This is but one of the many economical features of POMONA PUMPS.

SOUTHERN ENGINE and PUMP COMPANY
HOUSTON, TEXAS

POMONA Oceans or Water PUMPS

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SEAL OF QUALITY
DRILLING AND FISHING TOOLS

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EXPORT OFFICE 136 LIBERTY ST. NEW YORK CITY

Manufactured by
ACME FISHING TOOL Co.
Parkersburg, W.Va.
ESTABLISHED 1900

in gbo. Yount-Lee's Moore's Bluff 3, Esperson, 6970 ft in sand and shale.

MATAGORDA COUNTY—Empire's Baker 1, Citrus Grove, lcn.

MONTGOMERY COUNTY—Kelly Baker's Juergus 2, 3 mi Conroe, sd at 1910 ft.

ORANGE COUNTY—Gulf's W. H. Stark 1, Port Neches, 4780 ft in sand and shale. The Texas Co.'s Kuhn 2, Port Neches, oily mud and gas at 4410 ft, woc; Stark 2, Port Neches, 4590 ft hauling in 4¾-inch csg.

WALKER COUNTY — Richardson et al's Smither 1, 12 mi n Huntsville, sd at 3455 ft. Texas State Oil Co.'s Fails 1, nw Huntsville, sd at 1800 ft.

WALLER COUNTY — Kirby Pet. Co.'s Rogers 2, San Felipe, set 10-inch csg at 903 ft, dr in sand and bldrs at 1055 ft.

WASHINGTON COUNTY — W. B. Birdwell's Schram 1, 3 mi e Brenham, sd at 2108 ft. Clifton et al's Pruiss 1, 3 mi sw Brenham, dr at 1615 ft in shale.

WHARTON COUNTY—C. S. Thomas' Taylor 1, Boling, dr at 995 in grey lime; Volny 1, sd at 235 ft.

SOUTH LOUISIANA

ACADIA PARISH—The Texas Co.'s Rayne Hrs. 5, Evangeline, s flank, 8576 ft sandy shale. Yount-Lee Oil Co.'s Houssiere-Latrielle 9, Evangeline, se side, 4596 ft, water sand.

ASSUMPTION PARISH—Poor Boy Drlg. Co.'s La Barre Est. 1, Napoleonville, 502 ft sand and gravel.

AVOYELLES PARISH—R. A. Tippett's Chatalin 1, 5-1n-3e, 3404 ft sand.

CAMERON PARISH—Pure's Yount-Lee 9, Sweet Lake, 6810 ft, oil showing. Magnolia's Sweet Lake 1, 4726 ft, sticky shale. Shell's Watkins 15, Black Bayou, building derrick foundation; Black Bayou State 1, 882 ft, gbo, sp 7-17-30. Vacuum's Cameron Meadows 1, e Johnson Bayou, ds stuck 3953 ft. The Texas Co.'s State E. Hackberry 7, 827 ft sand; Calcasieu Lake State A-6, dk.

IBERIA PARISH—The Texas Co.'s State Vermilion Bay 5, 4434 ft, water sand. Jefferson Lake Oil Co.'s Lake Peigneur 7, Jefferson Island, set 12½-in cas 60 ft, sp 7-17-30. Lake Oil Co.'s Ben White 1, 54-12s-7e, 2063 ft, repairing rig.

IBERVILLE PARISH—Standard's Schwing 5, Bayou Blue, 2305 ft, oil show; Wilbert 5, Bayou Blue, 2905 ft, sandy shale; Wilbert 7, dk; Wilbert 8, 1012 ft, sand and gravel; L. Baist Cooperage Co. 1, Bayou Blue, capped piling; E. B. & S. P. Schwing 1, capped piling. Shell's Wilbert 5, White Castle, ru.

JEFFERSON PARISH — Humble's Delaware Fur Co. 1, 3 mi nw La Fitte, 1910 ft, ru.

LAFAYETTE PARISH—Pure's J. Mannotin 1, 5 mi n Lafayette, 4458 ft, gbo.

LA FOURCHE PARISH—The Texas Co.'s LL & E-Leeville 1, cemt 940 ft, 9⅝-in cas.

PLAQUEMINES PARISH — Humble's Cockrell-Moran 2, Lake Grand Ecaille, lcn; Cockrell-Moran 3, 1457 ft, sticky shale; Lake Washington 1, Lake Grand Ecaille, 5214 ft, waiting on 3-in drill stem. The Texas Co.'s Garden Island Bay State 4, 720 ft, woc.

ST. LANDRY PARISH—Pure's J. A. Perkins 1, Port Barre, 3181 ft, sticky shale. Hebert Baker Oil Co.'s Fisher 1, 10-3s-4e, 4375 ft, drill stem stuck. Alex Rice's Futral 1, Port Barre, 4623 ft, salt cap 4588 ft.

ST. MARTIN PARISH—The Texas Co.'s St. Martin Land Co. 3, test at 2630 ft. Yount-Lee's Hebert 2, Anse La Butte, 5560 ft, hard sand and rock. Rycade-Humble's Bayou Bouillon 10-B, Bayou Bouillon, 4286 ft, set 9⅝-in cas at 4260 ft, woc; Woodyard Lake 1, Bayou Bouillon, 4739 ft, shale and lime.

ST. MARY PARISH — The Texas Co.'s South Coast Co. 1, 4 mi n Franklin, 6286 ft, sandy shale. La. Ld. & Explo. Co.'s Chas. W. Fox 1, Avoca, 2953 ft, gbo.

TERREBONNE PARISH — Chas. Paggi's Evergreen 2, Houma, sd at 1800 ft. Freeport Sulphur Co.'s Nelson 1, 6023 ft, sd. The Texas Co.'s Bay Junop 2, lcn; Dog Lake A-3, lcn; Caillou Island 3, 100 ft, set 20-in cas; Caillou Island 4, lcn; Caillou Island 5, lcn; Lake Pelto B-2, ru; Lake Pelto 4, lcn; 5, lcn; 6, lcn; Bay St. Elaine 4, 5462 ft, shale and lime; Lake Barre State 4, flowing 1200 bbls daily; Four Isle 4, ru.

Equip your well for the last time!

WHEN you set a Jensen Jack on a producing well, you settle a knotty problem once and for all time. There is no method even ALMOST as efficient and economical.

Old producers and experienced power men are invariably astounded. Production goes up; the power bill comes down. And there they stay!

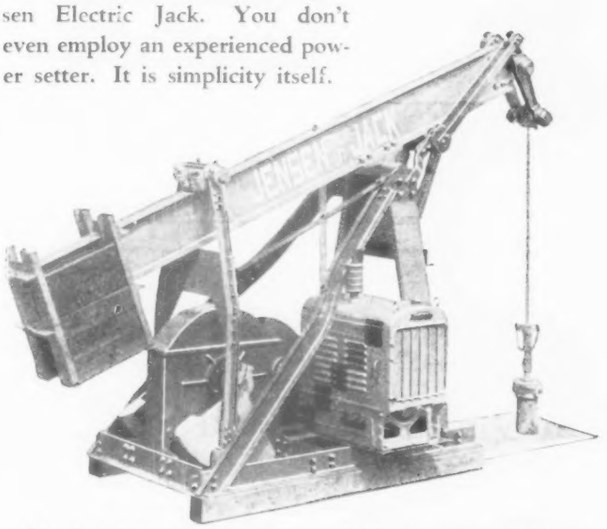
The No. 10 Electric Jack, smallest of the lot, handles a 2000-foot well through 2-inch tubing with a 5 H. P. motor. How does it do it? We'd like to send an engineer to look over your lease and go into details. In the meantime, here are a few of the highlights:

You balance a Jensen Electric Jack until the power required on the up and down stroke is the same. You do it by removing the plug in the top of the motor, inserting a crank, then adding counterweights until the desired result is obtained.

The bearings in the gear reduction are Timken, Hyatt and S. K. F. The gears are cut and polished to wonderful accuracy and run in a bath of oil completely enclosed.

The motion is the time-tried Titan Straight Lift, used by the Titan Jacks we build for use with pumping powers. It is the most efficient straight-lift known to the industry.

You build no house for a Jensen Electric Jack. You don't even employ an experienced power setter. It is simplicity itself.



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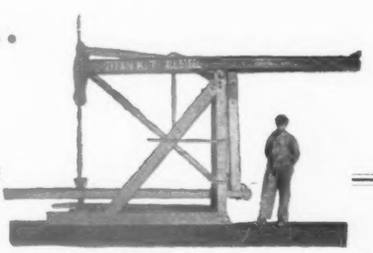
JACKS



FOR many years, Jensen Brothers Mfg. Co. has built Jacks for use with pumping powers. For wells of every depth and volume, everywhere around the world, they have set new standards of dependability and economy.

T-I-W Features That Give Superior Performance

The T-I-W CHRISTIAN BIT gives you all the advantages of a short bit and a long bit, without the disadvantages of either. Drills with the speed and efficiency of the short bit without sacrificing the straight-hole advantages of the long bit.

Strength from Tubular Construction

It is a principle of engineering that tubular construction gives more strength than the same material in another form. Note the application of this principle in the T-I-W CHRISTIAN BIT.

Prevents Balling Up

The oval shape of the bit greatly lessens the tendency to ball up while the bit is rotating. This principle has been proven by the most rigid field tests and the experience of oil men who have used the bit.

Write for Illustrated Folder

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WESTBROOK-THOMPSON HOLDING CORPORATION

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EDWARD R. LAND, *Sec'y-Treas.*

1805 Electric Building

FORT WORTH TEXAS

NORTH LOUISIANA

Completions

Company, Well and Location	Production Bbls.	Depth
BIENVILLE PARISH—		
Ark.-La. P. L. Co., K. G. Gardner 1, 22-16-10	¶3½	2020
DE SOTO PARISH—		
Benson O&G Co., Harris 1, 6-10-13	*	3650
FRANKLIN PARISH—		
Davis e/a Moore 1, 12-11-6	*	1430
SABINE PARISH—		
Teteco Oil Corp., La. Long Leaf Lbr. Co. 1	*	4027

BIENVILLE PARISH—Ark-La. P. L. Co.'s A. G. Thomas et al 1, 22-16-10, cmtd 7-inch cas 2568 ft, drg, sd 2575 ft. W. A. Nichols et al's McDermott 1, 28-18-6, ds test 2281-2358 one fourble mud 10 ft oil, wtg 6-inch.

BOSSIER PARISH — Andrews & Davlin's Nattin 1, 15-22-14, dr shale 1350 ft. Autrey Oil Co.'s Johnson 1, 34-19-11, rgn up; McDade 1, 28-19-11, drk. Morgan et al's Wetherbee 5, 21-19-11, show gas, tested dry 1862 ft, dr 1952 ft. Triangle Drlg. Co.'s Bollinger 1, cent. se se 36-23-13, rgn up.

CADDO PARISH—Falcon Oil Co.'s Oden 1, 19-19-14, owdd, ar dpn. L. B. Mawk's Swann 1, 23-21-14, sd fuel 700 ft. R. W. Norton's Hill 1, 33-23-16, tested dry 5315 ft, dr 5390 ft.

CLAIBORNE PARISH — El Dorado Chief al's L. McGraw 1, 30-10-9, cmtd 10-inch cas 990 ft. National O&G Co.'s Kirkland 1, 35-9-1n, sd 2412 ft.

CLAIBORNE PARISH—El Dorado Chief Oil Co.'s J. M. Dance 1, sd 2240 ft. Leue Oil Co.'s Taylor 1, 16-22-6, sd 3004 ft. Triangle Drlg. Co.'s Hodges 1, cent. nw sw 6-19-5, rig up.

CONCORDIA PARISH — A. C. Glassell's Pittsfield 1, 41-8-10, sd 1453 ft. Joe Marr et al's Maxwell 1, 35-3n-8, cmtd 8-inch 2000 ft, td 2820 ft.

DE SOTO PARISH—Ark-La P. L. Co.'s Johnson 2, 2144 ft n, 1343 ft w cent. 7-11-13, bg 7/21, cmtd 10-inch cas 228 ft, dr 453 ft. Benson O&G Co.'s Harris 1, 6-10-13, dropped from report as dry hole, td 3650 ft. Joe Burnham et al's Hood 1, 30-11-14, dr gumbo 1870 ft. Ark-La. Pipe Line Co.'s Whitney 1, 28-10-14, dr shale 2790 ft. Michlouzanner O&G Co.'s Payne 1, 12-11-16, ds test dry 2079 ft, sd. Gulf Ref. Co.'s Dry 1, 14-11-15, cg chalky shale 1689 ft. Sam Gold's Platt 1, 23-13-14, rig up. Odell & Lawton's Tidwell 1, 11-13-14, sd 2612 ft. T. L. Philp's Talbot 1, 9-13-13, dk. Pelham & Bundy's Rhodes 1, bg 7/17 cmts 12½-inch cas 108 ft, dr 1010 ft. Frank Melat's Schryver 1, 35-14-13, wosr 150 ft oil in hole 2840 ft.

JACKSON PARISH—El Dorado Chief Oil Co.'s Southern Adv. Paper Co. 1, 35-15-4w, sd 1130 ft.

MOREHOUSE PARISH—Pelican Nat. Gas Co.'s Tensas Delta Ld. Co. 1, 17-18-6, 1320 ft n and 660 ft e sw cor loc. Ruston Drlg Co.'s Rucker & Platt 1, 8-20-6, sw 2488 ft drl sh and sd 2653 ft.

NATCHITOCHES PARISH—W. M. Coats et al's Collum 1, 28-9-10, drl sh and bldrs 1900 ft. S. D. McDaniels, Clark & Morse 2, 23-5-6, tested million ft gas 8 ft sd, sd 2536 ft. Robeline O&G Co.'s Winn 1, 7-8-9, sd 1600 ft.

RED RIVER VALLEY — W. D. Ball's Krumbholtz 1, 32-14-10, TA 2629 ft. E. C. Lucas' La. Delta Pecan Co. 1, 34-13-11, cmtd 8-inch cas 785 ft. Geo. L. Pace et al's Clarkson 1, 30-12-9, dr 460 ft.

RICHLAND PARISH—Austin & McDonald's Millsaps 2, 17-17-6, wo 2697 ft; Millsaps 3, 16-17-6, sw wo 2477 ft. W. C. Feazel's Landrum 1, 6-16-7, drk. International Gas Products Co.'s Lagrone 1, 7-16-7, loc.

SABINE PARISH—McDaniel's & Lieber's Batson 1, 16-8-12, wo 2526 ft. Loring Oil Co.'s Peavy-Wilson 1, 21-6-13, cg sh 4365 ft; Bowman-Hicks 5, 34-8-12, dr sdy lime 4176 ft; Schull 1, 26-8-12, dr soft chalk argn shoot 2600 ft. A. H. Tarver et al's Sabine State Bank 3, 26-8-12, dr 1650 ft. R. L. Gay, Tr.'s, Bowman-Hicks 8, 18-7-13, blg to test 2552 ft. LeGrand et al's Giaque 1, 6-7-12, loc; J. W. Hale 1, 1-7-13, loc. D. H. Riddick et al's Scretchfield 1, 18-9-12, sd 3280 ft. Paramount O&G Co.'s Woolums 1, 11-6-12, sd 1650 ft. Zeke Lohman's Wyatt Lbr. Co. 1, 18-4-11, rig. Lohman & Walker's Hubley 1, 21-7-11, dr 465 ft. Pelican Nat. Gas Co.'s La. Long Leaf 3, 4-7-

Straight to Pay Sand with

Appleman Gumbo Bits

The Appleman Bit is designed to give speed and a straight clean hole. Wherever used, you will find them going *straight to pay sand* and greater profits for the operator.

Speed

The Appleman Bit gives speed which eliminates wasted time, labor and materials. Its self-sharpening principle, effected by the concave shape of the blades and the hard facing which permits wear on the back to retain sharp cutting edges, contributes greatly to its speed. Another speed-giving feature is that straight water courses lead directly to the cutting edge allowing the rapid breaking up and washing away of cuttings. This means NO CHOKING UP.

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Because less weight is needed to feed the Appleman Bit it drills a straight hole. With the weight indicator reading 1000 to 3000 pounds pressure —never more than 3000—this bit gives the most excellent performance. There is less possibility of ruining the wall and wiping out is practically obviated.

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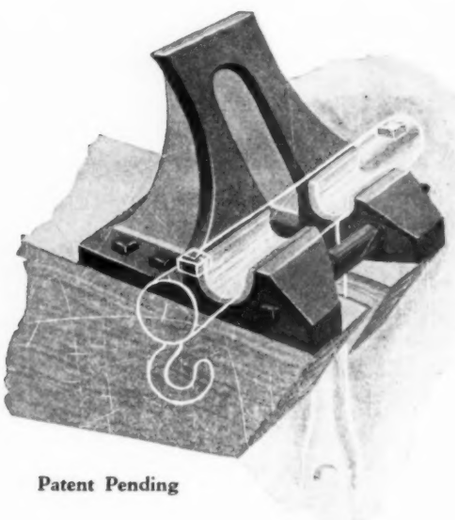
"*The* BEST"

A Time Worn Phrase

But if any tool has ever won the right to the title, it is the Burns Tubular Temper Screw known and stocked throughout the world's oil fields—*the undisputed evidence of unquestioned quality.*



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Quality in a new product

THE BURNS BEAM BEARING

for Temper Screws, saves the beam and makes unnecessary the practice of *half-soling*, or nailing a block of hardwood to the beam head. A *Safety first* device as it is impossible for Temper Screw to jump out.

No working parts, nothing to get out of order. Babbitt bearings prevent wear on the temper screw head. For sale by your Supply Store, write for prices.

BURNS *Tool Company*

OKMULGEE · OKLAHOMA

11, dr 1120 ft; Sabine Lbr. Co. 3, 6-7-11, log 7/21, dr. Stacy et al's Polly 1, 18-8-12, log. Teteco Oil Corp.'s La. Long Leaf Lbr. Co. 1, 18-6-12, jkd and abn 4077 ft. Longoria et al's Belton 1, 31-9-12, rgn up. Boone Tr.'s Hill 1, 4-6-11, drk. R. L. Gay, Tr.'s Sabine Lbr. Co. 5, 15-7-14, drk.

TENSAS PARISH—A. R. Willis' Curry 1, 39-11-12, dr sh and sd 2285 ft.

UNION PARISH—Fred Stovall's Murray 1, 32-23-4, rig up.

WEBSTER PARISH—Pat Hudson's Gardner 1, 1-22-11, dk. Sarepta Oil Co.'s Slack 1, 36-23-11, rig; Gardner 2, 1-22-11, rig; Gardner 3, 6-22-10, dk. H. M. Jones Drilling Co.'s Cook 2, 2-22-11, cmt 6-inch cas 2722 ft; Womble 1, 1-22-11, dk. Ideal O&G Co.'s Coyle 1, 24-23-11, dk. K. C. Supply Co.'s Cochrane 1, 36-23-11, plug back to 2713 ft, td 2726 ft. Magnolia Pet. Co.'s Sally Coyle 2, 2-22-11, dk; Scroggins 4, 1-22-11, cmt 8⅝-inch cas 2711 ft, argn test, td 2717 ft. Merrick Oil Co.'s Slack 3, 36-23-11, dk. S. H. Riggs, Tr.'s, L&A 1, 1-22-11, sd 2100 ft; L&A 2, 36-23-11, dk; L&A 3, 36-23-11, loc; L&A 4, 36-23-11, loc. Wingfield et al's Slack 2, 1-22-11, sw show oil argn dpn 2731 ft; Slack 3, 1-22-11 sw show oil argn dpn 2733 ft; Slack 4, 1-22-11, 600 ft n and 600 ft w se cor nw nw 1-22-11, lcn. W. O. Neely's Slack 1, 36-23-11, dk; Slack 2, 36-23-11, lcn. K. C. Supply Co.'s Slack 3, 36-23-11, lcn.

ARKANSAS

Completion

Company, Well and Location	Initial Bbls.	Depth
WHITE COUNTY—		
Letona Synd., Letona 1	*	3650

ASHLEY COUNTY—J. G. Marcum's McGurry 1, 10-19-4, sw 3555 ft, plug back for re-test.

CALHOUN COUNTY—Tidal Oil Co.'s Ark. Timber 1, 3-16-14, dry 2488-2506 ft, argn test 2534-49 ft.

CLEBURN COUNTY — Cosden Oil Co.'s Donophan Lbr. Co. 1, 19-9-10, sd 3875 ft. Donnell et al's Fee 1, 33-11-9, sd water 1575 ft.

COLUMBIA COUNTY — Sam Dorfman's Merrick 1, 16-17-20, sd 400 ft.

DREW COUNTY—McClintock & Goodka's Ogles 1, 35-13-5, TA 2625 ft.

FRANKLIN COUNTY—Red Bank Oil Co.'s Hamm 1, 33-10-4, dr hd sd 2399 ft.

GARLAND COUNTY—H. H. Givens et al's Garratt 1, 1-3n-19, dr sndy lime 3617 ft.

GRANT COUNTY—J. R. Lockhart's Cunningham 1, 11-5-16, dk.

JOHNSON COUNTY—Ark-La. Pipe Line Co.'s Cline 1, 16-10-24, dr hd sdy lime 2615 ft. Blackwell O&G Co.'s Wyver 1, 21-8-23, jarring out 6-inch cas 2100 ft, td 5600 ft. Conn Gable's Holing 1, 20-9-25, sd 2070 ft (C.D.).

LAFAYETTE COUNTY — Crawford Drlg. Co.'s Vaughn 1, 25-19-25, rig.

LAWRENCE COUNTY—Marguerite Drlg. Co.'s Broadway 1, 31-17-1s, sd 45 ft.

LITTLE RIVER COUNTY—Buck Oil Co.'s Taafe 1, 23-12-32, sdtr 110 ft, 4-inch cas 25-2 ft.

LINCOLN COUNTY — B. F. Thompson, Tr.'s, McGehee 1, 8-8-7, rig.

LOGAN COUNTY—M. W. Greeson's Parks 1, 21-8-24, sd 1309 ft. J. H. Flowers' White 1, 13-6-26, ur 5 3/16-inch cas 3570 ft, td 3610 ft.

MADISON COUNTY—J. W. Baxter's Hallem 1, 17-16-26, sd 540 ft.

MILLER COUNTY—Lenz et al's Johnson 1, 24-15-26, cmts 6-inch 2844 ft, argn test, td 2447 ft.

OUACHITA COUNTY — Anderson et al's Buck 1, 7-15-7, fsh 2723 ft. Belmont et al's Buck 1, 16-15-17, cmtd 12½-inch cas 120 ft.

PIKE COUNTY—Henderson et al's Tulyou 1, 26-8-24, loc.

POPE COUNTY—Ark.-La. Pipe Line Co.'s J. H. Moore 1, 16-9-21, cmtd 15½-inch cas 403 ft, dr 500 ft. Cosden Oil Co.'s Mo. Pac. Ry. 1, 13-9-19, dr hd sd 4786 ft.

SCOTT COUNTY — Heavener O&G Co.'s Reser 1, 36-4-26, straightening hole, td 1530 ft.

SEBASTIAN COUNTY—M. W. Greeson's Spears 1, 9-7-29, drlg hd sd 3476 ft. Mansfield Gas Co.'s Fee 14, 1-4-31, sd water 380 ft. Ozark Nat. Gas Co.'s Weaver 1, 27-8-30 drlg sd 2300 ft.

UNION COUNTY—H. L. Hunt's Pratt 1, 7-18-15 pumping sw td 2214 ft. Malloy & Co.'s Robertson 3, 6-18-13 loc; Murphy 1, 1-18-13 rig up. S. B. Hickman et al's Hogg 1, 35-16-

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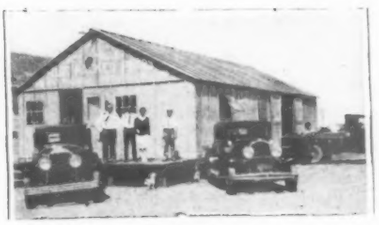

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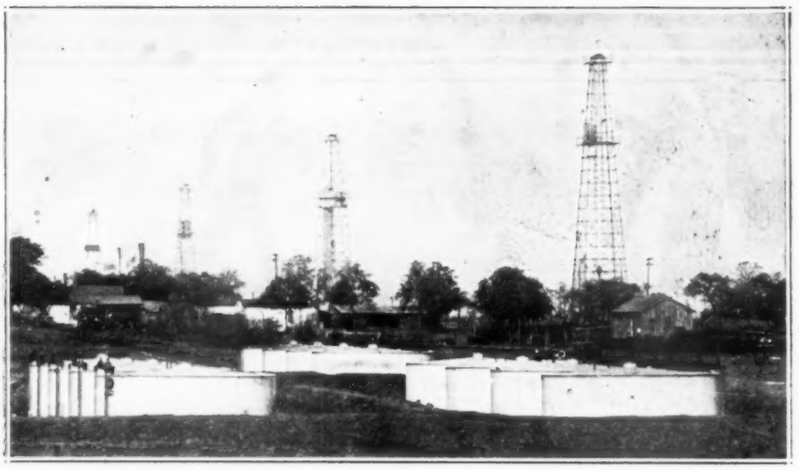

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MANUFACTURED to SAVE YOUR OIL

Equipped to hold 16 ounces of pressure or 2 ounces of vacuum, and coated with high grade aluminum paint to reduce temperature variations, MALONEY *Vapor-Pressure* Tanks eliminate breathing losses and thus insure maximum income from your oil production.

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MALONEY PATENTED BOLTED COPPER-STEEL TANKS

MALONEY

ALONE

17 fsg 2157 ft. Marine Oil Co.'s Thompson A-4, 10-18-13 drlg 2940 ft. South ElDorado Oil Co.'s Traylor 1, 9-19-13 wosr 400 ft fluid 2186 ft. Modisette Drlg. Co.'s Union Sawmill 1, 14-18-14 lcn. Sundby et al's Perdue 2, 23-16-14 s. d. 3207 ft.

WASHINGTON COUNTY — Taylor et al's Runny 1, 1-13-29 sd wo 700 ft. Lincoln Lease Holding Synd.'s Townsite 1, 30-15-32 ta 1500 ft. C. H. Willoughby's Jones 1, 34-16-30 s. d. 2150 ft. O'Hara & Shetterly's Boyd 1, 12-16-32 ta 850 ft. Delbert Graves' Cunningham 1, 14-15-32, s. d. gray sd 602 ft.

VAN BUREN COUNTY — J. S. Martin's Scanland 1, 5-9-13 s. d. 50 ft.

YELL COUNTY—
T. Luckett's Baloon 1, 36-7-21 sdtrk 5 3/16-in cas 4120 ft. td 4160 ft.

MISSISSIPPI

Completions

Company, Well and Location	Initial Production Bbls.	Depth
HINDS COUNTY—		
Jackson O&G Co.'s Taylor 1, 36-6-1e	*	3245
RANKIN COUNTY—		
Gulf Ref. Co.'s Rainey 1, 13-5-1e...	¶15	3607

ADAMS COUNTY—A. C. Glassell's Stowers 1, 28-8-2w cmt 12½-in 246 ft.

ALCORN COUNTY — Alcorn Pet. Co.'s Matthews 1, 14-2s-7e jarring out 6-in cas td 2735 ft.

CHICKASAW COUNTY — Hightower & Golson's Flemming 1, 20-13-3 sd wo 1414 ft; Flemming 2, 15-13-2w dk ptrnp.

HINDS COUNTY — Mrs. Ella Rawles Reeder's State Land 1, 25-6-1e fsg 4 in dr pipe 2905. Jackson O&G Co.'s Central Cotton Oil Co.'s 1, 3-5-1e, dk. Capital L&I Co. 1, 29-6-1e drlg 2179 ft. Love O&G Co.'s 1, Gordon 8-5-1e, 6⅝-in plug 2448 ft. Love Pet. Co.'s Mendoza 2, 12-5-1e bg 7/16-in cmt 15½-in cas 47 ft 10-in cas 756 ft. Tri-State O&G Co.'s Wilson 1, 23-6-1e dk. Dome Oil Co.'s Elton 1, 5-4-1e cmtd 6-in 2436 ft. Universal O&G Co.'s Holliday-Ross 1, 8-6-2e s. d. water 1295 ft; Sharbrough 1, 28-6-1e dk. Cane River Oil Co.'s Lufkin 1, 15-5-1e cmtd 6⅝-in cas 2465 ft on top chalk td 2467 ft. Ohio Oil Co.'s School 1, 16-12-1e drlg Wilcox 1900 ft. Marine O&G Co.'s Country Club 1, 31-6-1e ratholing Wilcox 2493 ft. Capitol O&G Co.'s Clark 1, 10-5-1e bg 7/21 drlg; Brown 1, 28-6-1e bg 7/20 cmtd 10-in cas 280 ft.

KEMPER COUNTY—W. S. Jones' Rosenbaum 1, lcn not given, drk.

LAFAYETTE COUNTY—F. E. West et al's May 1, 22-10-1w rig up wo.

LAUDERDALE COUNTY — Lauderdale O&G Co.'s Lackey 1, 2-7-16 s. d. 3420 ft. Meridian Nat. Gas Co.'s Mattie Hauser 1, 33-8-18 sdwo sdy sh 2826 ft.

OKLAHOMA

WOODS COUNTY—T 28n R 16w Sec. 23, Peerless Oil Co.'s Cromwell 1, c nw ne, hfw 6188-6211 ft dr sand. T 27n R 16w Sec 33, Sinclair's Share 1, c ne sw, dr 7045 ft.

ALFALFA COUNTY—T 27n R 11w Sec 12, Smith Bros.' Forbes 1, ne c se nw nw, td 1420 ft sd.

KAY COUNTY—T 27n R 2e Sec 17, Blankenship et al's Hansen 1, sw nw sw, td 3460 ft fshg. bit.

HARPER COUNTY—T 26n R 24w Sec 14, Sinclair's Howell 1, c sw sw, td 8590 ft pb 6700 ft will shoot.

GRANT COUNTY—T 26n R 5w Sec 25, Bu-Vi-Bar et al's Hurst 1, c sw, spd.

KAY COUNTY — T 26n R 1w Sec 32, Boucher et al's Jefferson 1, ne c sw, lcn.

HARPER COUNTY—T 25n R 20w Sec 12, Empire's Bruce 1, sw c ne ne sw, fshg 5570 ft.

WOODS COUNTY—T 25n R 15w Sec 10, Bu-Vi-Bar et al's Fee 1, se c sw, sd 6104 ft.

GRANT COUNTY—T 25n R 4w Sec 22, Cowden's Vollmer 2, ne c se ne sw, lost tools 5640 ft sd.

ALFALFA COUNTY—T 24n R 11w Sec 14, J. V. Bailey et al's Acre 1, c sw ne, salt water 4649 ft, 8-in 4660 ft woc.

GARFIELD COUNTY—T 24n R 6w Sec 5, Pulse & Beamer's White 1, se c nw, sand 5570-70 ft hfw dr 5575 ft.

WOODWARD COUNTY — T 23n R 17w Sec 23, Transcontinental & Prairie's Wilbur 1, ne c, sd 7425.

GARFIELD COUNTY—T 23n R 4w Sec

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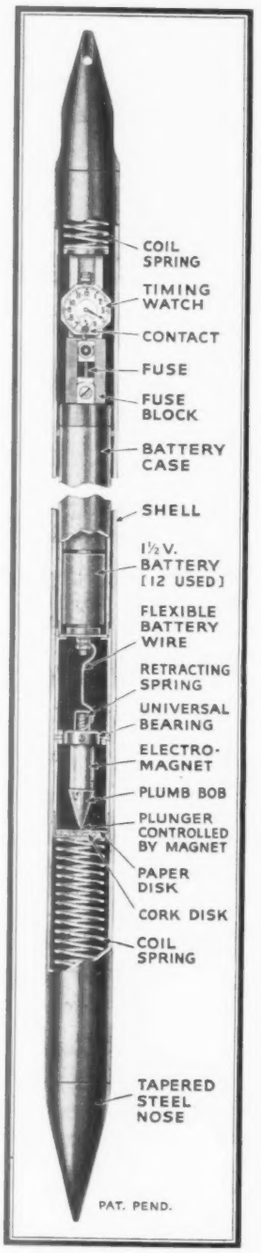

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WEST TEXAS

County Maps

Combination Maps

Descriptions and prices on application

HEYDRICK MAPPING COMPANY

Wichita Falls, Texas

32, Shell et al's Loomis 1, c nw nw, show oil & wtr 6132 ft, dr 6170 ft.

WOODWARD COUNTY—T 21n R 19w Sec. 15, Brugoyne Bros.' Merklin 1, sw c ne ne, sd 1910 ft.

BLAINE COUNTY—T 19n R 10w Sec 14, Washoma Pet. Co.'s Phillips 1, c nw sw, 3220-25 ft hfw, dr 4938 ft.

LOGAN COUNTY—T 18n R 3w Sec 33, Healey et al's Quier 1, se c sw, sd 3970 ft. T 17n R 4w Sec 34, Eason Oil Co.'s Katchor 1, sw c ne sw, dr 1610 ft. T 17n R 1e Sec 22, Prairie & Slick's Simms 1, ne sw se, fsh drill pipe 4750 ft.

KINGFISHER COUNTY—T 16n R 7w Sec 6, Gault Brown's Boch 1, c nw se (owdd) td 6022 ft sd.

LOGAN COUNTY—T 16n R 1w Sec 33, Prairie & Slick's Morgan 1, c nw ne, fsh tools 5275 ft.

PAWNEE COUNTY—T 23n R 5e Sec 15, Cochran et al's McFadden 1, ne c sw, rig.

OSAGE COUNTY—T 23n R 6e Sec 28, Western American 1, nw c se, hfw 1830.94 ft, dr 2120 ft.

PAWNEE COUNTY—T 22n R 3e Sec 26, Wentz's Lillie 1, se c sw ne, dr 1175 ft. T 20n R 5e Sec 22, J. M. Scott et al's Jones 1, sw c ne, dr 1400 ft.

NOBLE COUNTY—T 22n R 1w Sec 28, Gypsy et al's Bergstram 1, se c nw, hfw Wilcox 5150-5237 td 5644 ft hfw d&a.

PAYNE COUNTY—T 18n R 4e Sec 6, F. M. Marrs et al's Tietz 1, sw nw se, lcn.

LINCOLN COUNTY—T 17n R 2e Sec 28, Thruman, Deaner et al's Stufflebeam 1, ne c sw, dr 3740 ft. T 16n R 2e Sec 35, T. B. Slick's Hammer 1, se sw nw, Wilcox 5370-5474 ft, dr 6065 ft. T 16n R 4e Sec 2, Deep Rock & Peerless' Prowalt 1a, Wilcox 4606-13 ft water. T 14n R 6e Sec 5, Atlantic's Ryan 1, se c nw, dr 3046 ft. T 13n R 4e Sec 2, Magnolia's Winship 1, ne c sw, dr 4200 ft.

OKFUSKEE COUNTY—T 12n R 9e Sec 36, Henry Oil Co.'s Harjo 1, nw c, 6-in 3286 ft. co. T 12n R 10e Sec 3, Sheppard et al's Sheppard 1, se nw sw; td 3690 ft water.

MUSKOGEE COUNTY—T 11n R 19e Sec. 2, E. Mills et al's Martin 1, nw c se, sd 1001 ft.

PITTSBURG COUNTY—T 9n R 16e Sec 32, Pattison et al's McDuff 1, sw nw se, Wilcox 5556-60 ft co.

HASKELL COUNTY—T 9n R 18e Sec 10, Marion Oil Co.'s Sanders 1, nw ne sw, ¶2 gas 1800 ft sd 2692 ft.

LATIMER COUNTY—T 5n R 18e Sec 23, Limestone O&G's Shaw 1, nw ne nw, ¶2 gas 3220-80 ft td 3608 ft, d&a.

OKLAHOMA COUNTY—T 14n R 3w Sec 32, Mid-Kansas' Messer 1, sw c fshg 6007 ft. T 13n R 3w Sec 17, Prairie & Slick's Dills 1, c se nw, dr 6720 ft. T 13n R 3w Sec 35, Magnolia & Ramsey's Johnson 1, ne c sw, dr 7048 ft. T 13n R 1w Sec 13, T. B. Slick's Martin 1, c nw nw, td 6965 ft pulling casing to abnd. T 12n R 4w Sec 17, C. F. Cuniff Trustee's St. Joseph's Orphanage 1, sw ne sw se sd 6530 ft. T 11n, R 2w, Sec. 3, Ryan Consolidated's Lawton 1, ne c nw, dr 6803 ft.

CLEVELAND COUNTY—T 6n R 1e Sec 20, Harris & McNeal's Corbett 1, c sw ne, td 6518 ft 6-in 6330 ft woc.

OKFUSGEE COUNTY—T 11n R 8e Sec 11, Carter et al's Keys 1, sw ne sw, dr 1540 ft.

HUGHES COUNTY—T 9n R 12e Sec 29, Chas. Cannady's Kanard 1, nw c sw, dr 4333 ft.

POTTAWATOMIE COUNTY—T 8n R 3e Sec 3, Texas Co.'s Knight 1, sw c se, rur. T 8n R 4e Sec 11, Lippa Drlg. Co. et al's Helmerich 1, ne c nw dr 920 ft. T 6n R 4e Sec 30, Deep Rock's Marshall 1, sw c rur.

SEMINOLE COUNTY—T 6n R 7e Sec 9, Neal & Milton's Thomas 1, nw ne sw, lcn.

ROGER MILLS COUNTY—T 12n R 24w Sec 23, Bucy & Stone's Williams 1, c sw, sd 2943 ft. T 11n R 26w Sec 4, J. J. Rook's Davis 1, c nw ne, sd 2840 ft.

BECKHAM COUNTY—T 10n R 22w Sec 29, J. F. Cuniff et al's Brower 1, c nw, dr 3785 ft.

CANADIAN COUNTY—T 10n R 6w Sec 1, J. V. Bailey's Robinson 1, c ne nw, sd 150 ft.

CADDO COUNTY—T 9n R 13w Sec 18, J. J. Wright & Shell's Boys 1, ne c, lcn.

BECKHAM COUNTY—T 8n R 22w Sec 20, Carson et al's Denby 1, sw se ne, fshg 1625 ft.

WASHITA COUNTY—T 8n R 14w Sec 1, H. S. Kaufman's Nelson 1, ne c dr 950 ft.

GREER COUNTY—T 7n R 22w Sec 1, Ros

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Good & D. M. Dowell's Cliffel 1, nw c co 1185 ft. T 6n R 24w Sec 17, I.T.I.O. et al's Fee 1, c ne, dr 2340 ft.

CADDO COUNTY — T 6n R 11w Sec 24, Simms Pet. & J. R. Wrightsman 1, se c nw, rig.

HARMON COUNTY—T 4n R 24w Sec 17, Harmon-Tex Oil Co.'s Headly 1, ne c dr 2260 ft.

COMANCHE COUNTY—T 3n R 9w Sec 3, Okla. Nat. Gas Co.'s Doebel 1, ne c sw sw sw, sd 1450 ft.

STEPHENS COUNTY—T 1s R 9w Sec 3, Pelwin Oil Co.'s Perdy 1, nw c nw ne ne, show oil 2210-13 ft, sd 2470 ft.

COTTON COUNTY — T 4s R 13w Sec 2, Shasta Oil Co.'s McMillian 1, c se se, moving in tools.

PONTOTOC COUNTY—T 5n R 6e Sec 8, Magnolia & Twin State's Killcrease 1, sw ne ne, hfw 3507-13 ft, td pb 1785 ft sd.

HUGHES COUNTY—T 5n R 10e Sec 30, Erwin et al's Jones 1, se c ne dr 4120 ft. T. 5n R 11e Sec 15, J. J. Wright's Roberts 1, se c sw, ¶2 gas 915-18 ft sd 1475 ft.

GARVIN COUNTY—T 4n R 3e Sec 10, C. R. Obermeyer's Stricklin 1, ne c sw, sd 2880 ft. T 3n R 4w Sec 5, McMin & Arrowsmith's Carson 1, ne c nw, rig and tools.

COAL COUNTY—T 3n R 9e Sec 26, Blackwell's Gumm 1, nw, dr 2160 ft.

MURRAY COUNTY—T 2n R 2e Sec 27, Cheaftcn Royalty Co.'s Hendricks 1, sw se nw, show oil 1940-42 ft, dr 2180 ft.

ATOKA COUNTY — T 3s R 10e Sec 18, Brookshire et al's Guinn 1, nw c sd 80 ft.

CARTER COUNTY—T 4s R 2e Sec 32, Tex-Okla Drlg Co.'s Anderson 1, se ne se, sd 2580 ft.

LOVE COUNTY—T 6s R 3w Sec 20, Harry Hobbs' Steele 1, sw c ne ne sw, sd 3130 ft.

BRYAN COUNTY—T 6s R 7e Sec 8, G. L. Pace's Hicks 1, sw c nw, dr 500 ft. T 6s R 7e Sec 14, W. A. Johnson's Ussery 1, se c sd 325 ft. T 6s R 9e, Sec. 35, O. P. Bush, Commerce Trust Co., ne c, sd 600 ft.

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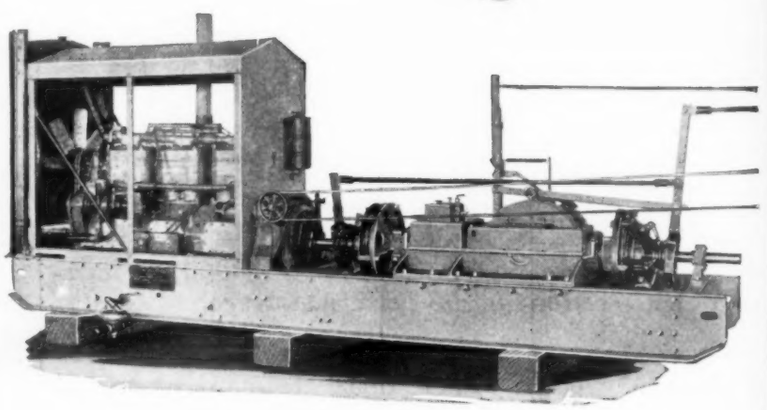

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SOUTHERN CALIFORNIA

FULLERTON—Brea Canyon Oil Co.'s [illegible] 47, dr brown shale and oil sand 4817 ft. Graham-Loftus Oil Co.'s G&L 1, dr sandy shale 5431 ft. L. C. Simmel's Todd 1, coring hard sand, 1909 ft. Fricke 1, fdn. Standard Oil Co.'s Bastanchury 1, dr hard sandy shale, showing little oil, 5970 ft.

HUNTINGTON BEACH — Barnsdall Oil Co.'s Syndicate 1, abu 6723 ft.

MONETA—Ohio Oil Co.'s Fish 1, 35-3-14, dr shale 6898 ft.

MONTEBELLO—Weist & Calthart's Germain 1, bldg new rig, td 4742 ft.

NEWHALL — Consolidated Oil Co.'s Hammond 1, 8-3-16, sd 2105 ft. Dudley-Newhall's 1, rig. M. K. & T. Oil Co.'s Farrier 1, 31-4-15, lcn. National Securities Co.'s Seeple 1, 1-3-16, dr shale and sand 1055 ft. Seigenborg-Horton-Rogers' Warren 1, 1-3-16, dr hard sand 1120 ft. Southern California Drlg. Co.'s Needham 1, ru. York-Lockhart Oil Co.'s Clampitt 3 13-3-16, ru. Webb & Bush's Trumbull 1, 1-3-16, ru.

NEWPORT—H. L. Hall's 1, 20-6-10, sd 700 ft. Mesa Petrol Corp.'s B&G 1, 16-6-10, pmpg water 4910 ft. Standard Oil Co.'s Irvine 1, 26-6-10, reaming to straighten hole 1028 ft, td 1232 ft.

PLAYA DEL REY—Cory-Randall-Clarke's 1, ru.

PUENTE HILLS—Bardeen Petrol. Corp.'s Didier 1, 9-25-10, dr sand, streaks brown shale 2119 ft. Grimes-Girrard Oil Synd.'s 1, sdtr 1510 ft. Marcell Pet. Co.'s Marcell 1, sd 2537 ft. Rio Hondo Pet. Co.'s Rowland 1, 14-2-10, dr out cmt 2444 ft. Union Oil Co.'s Sansinena 11, 30-2-10, dr brown shale and oil sand 3898 ft. Western Gulf Oil Co.'s Diamond Bar 1, dr hard sand and shale 6190 ft.

ROSECRANS-DOMINGUEZ — Burlingham Pet. Corp.'s Hardy 1, 17-3-13, dr sandy shale and grey sand 4320 ft. Don L. Francis' —, sd 550 ft. McMahon and McDonald's Kirst 1, dr sandy shale 4480 ft. Tri-State Pet. Cor.'s 1, dr brown shale, streaks sand, 3525 ft.

SAN FERNANDO—Shell Oil Co.'s Andrews 1-1, 19-2-15, dr 3711 ft.

SANTA FE SPRINGS — L. S. Hartman's Campos 1, dr hard sand 4125 ft. Tureco Oil Co.'s Cole 1, 29-2-11, td 5500 ft. Union Oil Co.'s Orchardale 1-1, 10-3-11, dr shell 2682 ft.

TORRANCE — California Ventura Oil Co.'s Holston 1, 31-3-14, dr shale, streaks sand showing oil, 3169 ft. Rio Grande Oil Co.'s Watson 1, 17-4-13, dr sand and shale, 5813 ft. United Kern Pet. Co.'s 1, plug to 4300-4380 ft to test upper showings, td 4680 ft.

NORTHERN CALIFORNIA

KERN COUNTY

ANTELOPE PLAINS—J. Wrenn's No. 1, 32-25-17, rep rig, td 640 ft.

BELRIDGE—J. H. Kennedy's No. 1, 5-29-21, sd 2137 ft. Richfield Oil Co.'s Belridge 1, 22-27-20, redr 460 ft, td 665 ft. Rio Grande Oil Co.'s Garcia 1, 18-28-22, fsh, td 3681 ft. K. C. Wallace's No. 1, 32-29-21, dr sandy brown shale, gas shwgs 3410 ft.

BUENA VISTA HILLS—Federal Drilling Co.'s No. 1, 20-31-24, lcn.

BUTTONWILLOW — Nordon Oil Corp.'s Salisbury 1A, dr blue shale 2535 ft.

COMANCHE POINT—W. W. Stabler's No. 1, 4-11-18, dr hard shale 1625 ft.

DEVIL'S DEN—Tom Hannon's No. 1, 25-25-18, idle 2620 ft.

EDISON—Petroleum Securities Co.'s Johnson-Moss 1, 14-29-29, dr soapstone 750 ft. F. M. Sayre's No. 1, 5-30-29, co 4222 ft.

EL TEJON—Elmer Oil Co.'s Tejon 1, 15-30-30, dr hard sand 4650 ft. J. J. Ritchie's No. 1, 33-11-19, dr hard sand and shale 310 ft.

GOULD HILLS—Bomke & Ball's Larson 1, 12-29-20, idle 2767 ft. Casa Mira Oil Co.'s Theta 1, 20-28-20, idle 3665 ft.

JASMINE—Hancock Oil Co.'s No. 1, 23-25-27, idle 2665 ft.

LERDO—Shell Oil Co.'s Lee 1, 23-28-26, dr sand and shale 4592 ft.

McKITTRICK—Ohio Oil Co.'s M&M 1, 32-20-22, dr hard formation 6580 ft. California Oil Producers, Ltd., Wisecarver 1, 30-30-22, idle 5040 ft.

PATTIWAY—H. A. Bardeen's Klipstein 1, 18-10-23, dr hard sand 1179 ft; Ramsey 1, 10-10-23, dr sandy shale, oil showings.

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Williams 1, 17-27-23, plugged back, td 4249 ft.

SHALE HILLS—Rio-Cal Pet. Co., Ltd.'s, No. 1, 2-27-18, dr hard sand 1150 ft. Girard Oil Co.'s Watkins 1, 28-26-18, idle 910 ft.

WEED PATCH—Shell Oil Co.'s Porter-Day 1, 29-30-29, swabbing, td 4965 ft.

SANTA BARBARA COUNTY

CAMPBELL'S POINT — Bolsa Chica Oil Corp.'s Augur Permit 191, 24-4-19, dr hard brown shale 776 ft.

CASITAS PASS—Standard Oil Co.'s Shepard 2, 26-4-25, dr red sand, streaks hard red shale 1063 ft.

CASMALIA—Wildcat Oil & Royalty Co.'s Donovan 1, 20-10-35, dr 4670 ft.

EL TORO—Shell Oil Co.'s Fithian 1, 18-4-25, dr hard sandstone 4156 ft.

GATO RIDGE—Barnsdall Oil Co.'s Tegnazzini 1, dr hard brown shale 2292 ft.

GOLETA—Walter Barnhart's Pomatto 1, 1-4-29, flows fresh water, td 2154 ft. General Pet. Corp.'s Crandall Permit 138, 1, swabbed water, trace gas, sd 4931 ft; More 2, plug 4150 ft, temp. susp., td 4343 ft. Ring Oil Co.'s Mariam More 1, dr gray and brown shale 4900 ft.

LOMPOC—Prairie Oil & Gas Co.'s Shyvers 1, 11-7-35, dr sandstone 4100 ft.

NAPLES—J. H. Cochran's No. 1, 7-4-29, stdg. cmtd. 12-inch cas 290 ft, td 290 ft.

ORELLA—General Pet. Corp.'s Erburu 7, 32-5-30, dr brown shale and shells, 420 ft. Shell Oil Co.'s Orella 1, lost circulation, cmt to regain, td 2287 ft.

PT. CONCEPCION — Standard Oil Co.'s Gerber 1, dr hard grey sand, streaks black shale, gas showings, td 5007 ft. Universal Consolidated Oil Co.'s Rancho Concepcion 1, 30-5-34, sd 3526 ft.

PURISIMA — Vaqueros-Major Oil Co.'s Union Annex 1, 6-7-33, putting on pump, td 2997 ft.

SANTA MARIA — O. C. Fields Gasoline Co.'s Norswing 1, 8-9-33, prep to deepen, td 3665 ft; Bradley 1, trying to pull 4½-inch cas, td 5267 ft.

SANTA YNEZ—Deuell & Cole's Brinkhoff 1, 9-7-30, susp. 3080 ft.

VENTURA COUNTY

FILLMORE—General Pet. Corp.'s Burson Ranch 1, 6-3-19, co to 2680 ft, dr 2771 ft.

HOPPER CANYON—Geo. H. Hadley, Jr.'s No. 1, 13-4-9, dr brown shale 850 ft.

PIRU—Bolsa Chica Oil Corp.'s Snow 1A, 4-4-18, dr sandy brown shale 2422 ft. Macrate's Torrey-Eureka 1, 34-4-18, ru.

RINCON—Associated Oil Co.'s Snowball 1, 19-4-24, m on iron 2082 ft, td 2100 ft. Chanslor-Canfield-Midway's Hobson A2, rep rig, td 7479 ft.

SANTA MONICA MOUNTAINS—Olympic Corp.'s Calabasas 1, 18-1-17, dr sandy brown shale 5495 ft.

SANTA PAULA—Empire Oil Co.'s Steen 4, 13-4-1, dr grey sandy shale 3725 ft. San Pedro Pt. Fermin Oil Co.'s Kellerman 2, 13-4-21, dr hard lime 1330 ft. Geo. C. Thompson's No. 1, 15-4-21, dr brown shale 1020 ft.

SATICOY—Standard Oil Co.'s Citrus 5, 10-2-22, redr 8446 ft, td 8530 ft.

SIMI—Richfield Oil Co.'s Tapo 48, 36-3-18, dr shale and oil sand 1225 ft.

SOMIS—Shell Oil Co.'s Everett 1, dr brown shale 2387 ft.

VENTURA—Prairie Oil & Gas Co.'s Sexton 1, 30-3-22, dr brown shale 6486 ft.

MISCELLANEOUS

FRESNO COUNTY—Ohio Oil Co.'s Welch-Brix A1, 8-21-15, spudded, td 140 ft. Richfield Oil Co.'s Schrock 1, 33-22-16, dr brown shale 2125 ft.

KINGS COUNTY — Hornaday & Huggins' No. 1, 32-14-18, fsh 5050 ft. J. E. O'Donnell's No. 1, 7-23-20, fsh 4310 ft.

MONTEREY COUNTY—Standard Oil Co.'s Piedmont 1, 23-22-7, dr hard grey sand 4676 ft.

STANISLAUS COUNTY—Oakdale Oil Co.'s Gilbert 1, 3-2-10, td 3520 ft, wtg on cas.

SAN LUIS OBISPO COUNTY—Panorama Oil Co.'s Panorama 1, 7-31-21, fsh, td 4010 ft. Paso Robles Synd.'s Emerick 1, 34-27-11, prep to deepen, td 3892 ft. Latin American Pet. Co., Ltd., Whitley 1, 31-27-15, prep to test, td 4486 ft. Pismo Dome's Pricco 2A, 5-31-13, dr brown shale, streaks sand, 2595 ft. Texas Pacific Coal & Oil Co.'s No. 1, 25-32-14, temp. susp. 4000 ft.

TULARE COUNTY—Ducor Pet. Co.'s Zimmerman 1, 14-24-27, dr slate 2145 ft. Consolidated Properties, Ltd., No. 1, 35-22-17, rig. Terra Bella Drlg. Co.'s No. 1, 34-22-17, rig. Terra Bella Oil Co.'s Gardiner 1, 35-22-27, prep to re-cemt, td 918 ft. Western Oil & Exploration Co.'s Gardiner 1, 35-22-27, dr green shale 836 ft. Rey White's No. 1, 8-23-26, 8⅝-in cas cmt, 3975 ft, td 4022 ft.

MOUNTAIN STATES

COLORADO

ADAMS—N. M. Slatt 1, se 27-25-64w, stand 1920 ft.

ARAPAHOE—McDebb Dr. Co.'s Fitzsimmons 1, 7-45-66, prep to run 4¾-in to 5692 ft.

ARCHULETA—Outwest Inv. Co.'s Fitzhugh 1, se 34-33n-1e, dr 170 ft.

BACA—A. R. Jones & Optg Co.'s Boice Cattle 1, 23-34s-42w, dr 1900 ft.

BOULDER—Reliance Oil Co.'s Erickson 1, nw 33-2n-70w, dr 3145 ft.

DELTA—Crawford O&G Co.'s McKissen 1, ne 28-15s-91w, stand 1100 ft.

DOLORES—Transcontinental's Glade 1, nw 11-41-n-16w, dr 6700 ft.

DOUGLAS—Perry Park Oil Co.'s Cannon 1, nw 11-9s-69w, dr 630 ft.

EL PASO—Utemore Syndicate's Carson 2, ne 10-16s-66w, dr 835 ft.

FREMONT—Westerville Oil Co.'s State 1, nw 16-18-69, sd 1214 ft. Hammond & Roscoe's Beltrame 1, se 1-9s-70, sd 1800 ft.

GARFIELD—Fulton Pet. Co.'s Permit 1, ne 8-8s-10?w, dr 100 ft.

JACKSON—Midwest Refining Co.'s Rich 21-X, nw 9-6n-80w, dr 500 ft. P. & R.'s Hendershot 1, ne 2-6n-81, dr 4150 ft.

JEFFERSON—Ruby Hill O&G Co.'s Braden 1, se 24-4s-59w, co 3568 ft.

HUERFANO—Parker Club and Kinney Coastal, Fee 1, se 4-28s-69w, fsg cas 4116 ft. Elliot et al's Abeyeta 1, nw el-27-65w, location. Ojo Exp. Co.'s Ojo 1, 5-29s-69w, fsg 159 ft.

LARIMER—Barrow's et al's Barrows 1, se

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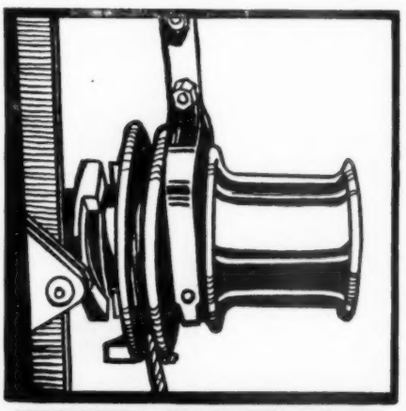

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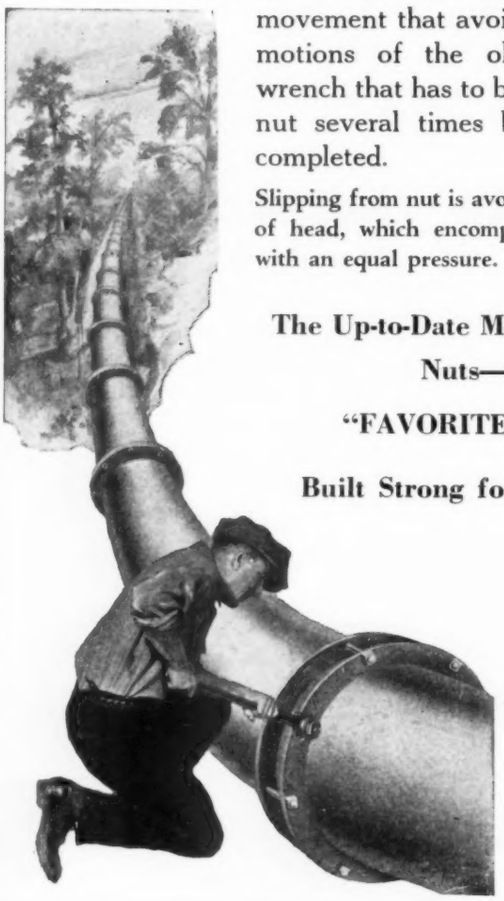

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7-11-68, sd 2310 ft. Deininger et al's Re- bey 1, nw 35-4n-70w, res at 354 ft. Erbe Co.'s Monroe 1, ne 26-11-69w, location.

LAPLATA—McGarr Pet. Corp.'s Red Me- 1, ne 27-33n-12w, resum 2186 ft. Detroit Assn's Olbert 1, se 9-35n-12w, stand 2623 ft. Murchison Oil Co.'s Doescher 1, nw 29-33- 13w, prep to spud.

LINCOLN—Kelly Oil Co.'s State 1, ne 3- 14n-57w, stand 3415 ft.

MESA—Argo Oil Co.'s Hoel 1, ne 23-3- 104w, sidetr 2775 ft., td 2790 ft.

MOFFAT—Vermillion Oil & Gas Synd.'s 1, se 23-9n-100w, stand 642 ft. Midwest's Hannawalt 24, 4-6n-92w, dr 2950 ft. Mtn Fuel Supply's 1, 35-12-101, test gas at 1990 ft. Mtn Fuel Supply's Musser 1, 5-11-97, stand cem 1040 ft. S. H. Keoughan et al's State 1, sw 16-4n-101w, dr 1400 ft.

MONTEZUMA—Haller et al's Haller 2, 33-36n-14w, dr 177 ft.

MORGAN—Ind. Terr. Illum. Oil Co.'s State 1, ne 16-1n-7w, dr 2165 ft.

PARK—So. Park Oil Co.'s Milligan 1, se 13-9s-76w, dr 792 ft. So. Park O&G Co.'s Esche 1, ne 5-9s-76w, dr 155 ft.

PUEBLO—Beulah Dome Co.'s Bedland 1, se 13-8s-76w, dr 721 ft.

RIO BLANCO—Texas Prod. Co.'s Potter 1, sw 30-2n-69w, gas at 5987 ft., blow to co. Magnolia Pet. Co.'s Fordham 1, sw 9-2s-96w, dr 5100 ft.

ROUTT—Gillespie et al's Omholt 1, se 29- 4n-87w, ready to spud.

WELD—Platte Valley Pet. Corp.'s Patterson 1, se 24-6n-61w, stand 6324 ft.

WASHINGTON—Middlemist Oil Co.'s Middlemist 1, se 14-4s-56w, dr 1260 ft.

IDAHO

BANNOCK—Norton Bros. et al's Marsh Valley 2, lot 5, 19-10s-37e, water 2465 ft., to run cas to sc.

CLARK—Monida Oil Co.'s Beaver Dome 1, nw 32-14n-36e, sd 1360 ft.

POWER—Gem State Pet. Co.'s Arbon Valley 1, nw 2-11s-33e, sd 3800 ft.

TETON—Grand Teton Oil Co.'s Horseshoe 1, se 33-5n-44e, dr ahead td 2780 ft. Teton Land & Leasing Co.'s Bevan 3, se 28-5n-44e, fsg 1580 ft.

WYOMING

BIG HORN—P. & R. Gov't. 3, 24-56-98, fsg. td 4183 ft. Westland Oil, Inc. 1, 24-54-95, sd 360 ft. Wisconsin Holdings, 4-55-97, sd 665 ft. Yellowstone Pet. Co.'s 1, 7-57-97, show 3892 ft.

CARBON—C. E. Biven et al's Baggs 2, 36-13-92, location.

FREMONT—Texas Prod. Co.'s State 1, 36-34-95, dr 4425 ft. P. & R.'s 1, 33-34-92, repair boilers 3437 ft. Premier Oil Co.'s 1, 7-28-92, res at 1911 ft.

HOT SPRINGS—Midwest's Weeks 8, 6-55-98, dr 2555 ft. Ohio's Smith 1, 8-46-99, change to rotary 4403 ft. Gebo Con's 1, se 23-44-95, sd for equipt. 1375 ft.

JOHNSON—United Oil Co.'s 1, 7-47-92, sd 1700 ft.

LINCOLN—Midwest's Grey's River 1, 25-37-117, dr 2245 ft. Mtn Oil Corp. 1, 36-25-115, fsg 815 ft. Wyo Prod. Co.'s 1, 14-24-113, res 270 ft.

NATRONA—Midwest's Midway 1, se 23-35-79, dr 5080 ft. Casper Prod. Co.'s 1, 36-36-11, rig. Schwartz Syndicate, sw 24-36n-85w, mvg in.

PARK—P. & R.'s Pitchfork 1, 14-48-102, dr 3584 ft. Resolute Oil Co.'s 1, 17-27-101, dr bel 5800 ft. Cody Pet. Co.'s Danker 1, se 22-57-98, swedging 10-in., td 3668 ft. C. M. Johnson's 1, 11-49-102, dr 4208 ft.

SWEETWATER—Vermillion Oil Co.'s 1, se 16-12-99, 10-in. cem 2650 ft. to test gas.

SHERIDAN—Pfeiffer et al. 6-57-84, location.

WESTON—Gose Synd.'s 1, 28-47-65, res 4800 ft. Updike et al's Fiddler Creek 1, 11-45-64, dr bel 1200 ft.

NEW MEXICO

DE BACA—Matador Oil Co.'s Wood 1, se 6-4n-20e, res at 3005 ft.

EDDY—Lockhart et al's Parker 2-X, se 3-17s-30e, dr 2750 ft.

LEA—Fisher & Lowrie's State 1, nw 11-18s-36e, dr 5430 ft. Texas-Pacific Coal & Oil Co.'s State 4, nw 21-33s-36e, dr 3890 ft. Hobbs High Oil Co.'s State 1, se 35-18s-38e, dr 3000

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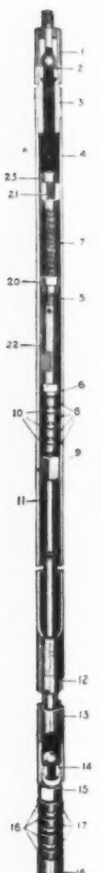

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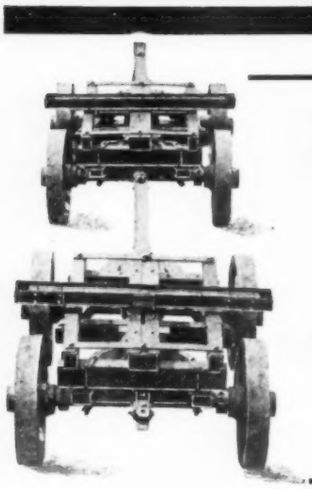

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ft. Landreth Prod. Co.'s State 1, 7-18s-38e, dr 3710 ft. Amerada's State 1-A, ne 32-18-38, dr 4000 ft. California Co.'s State 1, se 29-18s-38e, dr 4045 ft. Humble O&R Co.'s Bowers 2-A, 30-18s-38e, dr 3840 ft. Sun Oil Co.'s McKinley 1, ne 5-18s-38e, dr 3700 ft. Shell Pet. Corp.'s State 2, ne 32-18s-36e, dr 3910 ft. Morton et al's State 1, ne 32-11s-38e, fsg 5305 ft. Tidal's Coleman 1, ne 17-21s-36e, dr 3860 ft. Continental's Meyer 1, nw 28-22s-36e, dr 3645 ft. Atlantic Oil Co.'s State 1, ne 5-19s-38e, dr 1265 ft.

McKINLEY—J. W. Halsell's Santa Fe 1, 17-18-9w, dr 3267 ft. Wms. et al's A. T. S. F. 1, sw 19-18n-8w, dr 2165 ft. Walker Dome Oil Co.'s 1, 12-15-10, stand at 1012 ft.

RIO ARRIBA—Berringer et al's Hartman 1, ne 8-29n-7w, sd 825 ft. San Juan Pet. Co.'s Gov't 1, se 14-30n-7w, stand 270 ft.

SAN JUAN—Dorothy Oil Co.'s Terwilliger 2, 29-30-9w, stand 1810 ft. Southern Union Gas Co.'s Day 1, se 20-28n-10w, td 1765 ft. Childers Dr. & Pr. Co.'s Westwater 2, nw 23-31-16w, sd 2525 ft. Reserve Oil Co.'s Shafer 2, ne 1-21n-14w, sd 780 ft.

SAN MIGUEL—Pioneer O&G Co.'s Thunderbird 1, nw 14-15n-16e, wait 2355 ft. Starr Oil Co.'s Adams 1, ne 25-17n-16e, 8¼-in. at 3171 ft. Cibola Pet. Co.'s Crown 1, se 9-13n-14e, ready to resum 320 ft. Hendshield Dev. Co.'s Cabra Springs 1, ne 21-12n-22e, dr 1215 ft.

SOCORRO—Lockhart & Co.'s Stackhouse 2, 14-3s-6e, dr 2955 ft.

TORRANCE—Williams et al's Staplin 1, ne 16-8n-10e stand 1643 ft. J. B. Watt O&G Co.'s Kutchem 1, 12-17s-7e, dr 1100 ft.

VALENCIA—Rio Puerce Oil Co.'s N. M.-Ariz Land Co. 2, ne 13-6n-2w, wtg pipe 3145 ft. Acme Oil Co.'s N. M.-Ariz Land Co.'s 1, 26-6-3, stand 4741 ft. Harlan et al's Harlan 1, 5-6n-2s, fsg 4330 ft.

MONTANA

CASCADE—Andover Oil Co.'s Floweree 1, se 20-21-2w, dr bel 500 ft.

FERGUS—Melton Corp.'s 1, se 24-21n-17e, resum at 2700 ft.

GALLATIN—California Co.'s Ringling 1, se 35-5n-7e, dr 5104 ft.

GLACIER—Glacier Oil Co.'s Omsberg 1, nw 35-35-5w, skd rig. Kootenai O&G Co.'s 1, 13-35n-6w, dr 750 ft. Fulton Pet. Corp.'s Blackfoot 1, ne 28-36n-12w, bldg rig. O'Neill's Michaelson 1, se 28-36-5w, dr 2400 ft. B. & H. Oil Co.'s Haines 1, se 2-34-6w, set cas at 100 ft, dr ahead.

GOLDEN VALLEY—Golden Valley Oil Co.'s 1, se 28-6-22, dr bel 1200 ft.

LIBERTY—Square Deal Oil Co.'s Federal Land Bank 1, 1-32n-7e, stand 3565 ft, ready to res. Northland O&G Co.'s Yurman 1, 35-33n-6e, sd 2300 ft, wait cas. Sunburst O&R Co.'s McLaren 1, se 9-37-6e, dr 10-in. td 2240 ft. Utopia Oil Co.'s Eleanor Assn 1, sw 11-33-6e, dr 1750 ft.

MUSSELSHELL — Minnesota-Flatwillow's Ivanhoe Dome test, 7-11-31, to res.

PETROLEUM—Minnesota-Flatwillow's 2, 5-13n-25e, ream to set cas 1840 ft. Oregon-Flatwillow's 1, 3-13n-26e, td 200 ft.

PONDERA—Miller Bros., Bruins 1, nw 17-28n-1w, rig up. Oil Well Dr. Co.'s Van Daele 1, ne 35-30-3w, fsg tools at 4215 ft.

ROSEBUD—Prairie O&G Co.'s N. P. 1, 9-10n-39e, sd 2310 ft. Prairie's N. P. 3, 26-10-39e, try to cem off water at 2600 ft. Prairie's N. P. 4, 28-10n-38e, sd 65 ft.

SHERIDAN—Cheyenne O&G Co.'s 1, nw 15-36n-53e, to res at 1400 ft.

TETON—Andover Oil Co.'s Carlson 1, ne 5-24n-4w, td 300 ft. Newman et al's Fitzgerald 1, 26-32n-1w, rig up. Rocky Mtn O&G Co.'s Salmond 1, ne 4-23n-8w, stand 1700 ft. Earl Oil Corp.'s Gad 1, se 22-22n-8w, cem 12½-in. at 2006 ft. and dd. Midwest Ref. Co.'s Scott 35, ne 2-26n-6w, dr 105 ft.

TOOLE—Anaconda Pet. Co.'s Berthelte 1, ne 19-36n-2w, to dd from 1600 ft. John Thomas et al's Buckley 1, ne 1-37-4w, td 1645 ft. Mont. Oil Corp.'s Beaupre 1, se 32-37-1w, ur 8-in. to 1906 ft. Internat'l Roy. Hold Co.'s Henry 1, se 26-35-3e, tools lost at 2060 ft. Carnegie Pet's Rigney 1, se 28-36-4w, caving 2647 ft. Vanalta Oil, Lt., Peterson 1, sw 22-34-4w, dr 1000 ft.

VALLEY—T. P. Jones' 1, nw 31-37-38e, water at 1100 ft., to dd.

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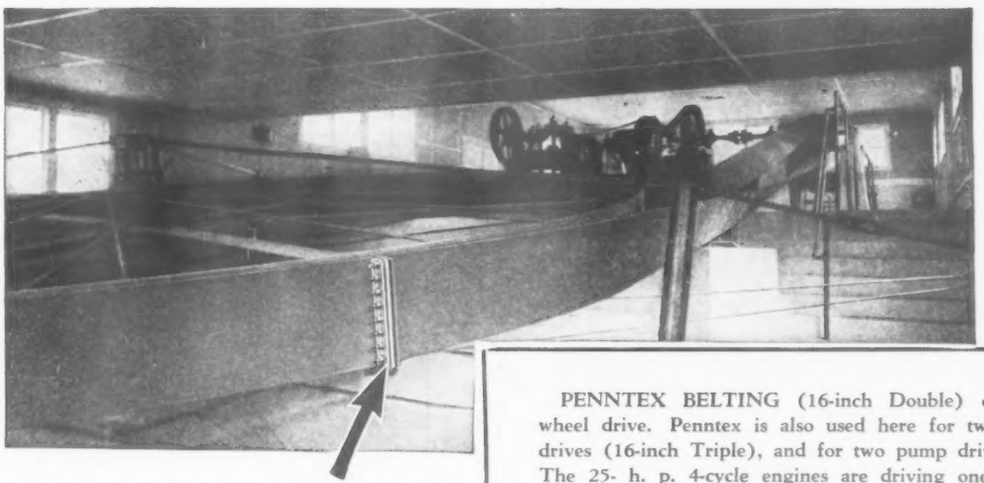

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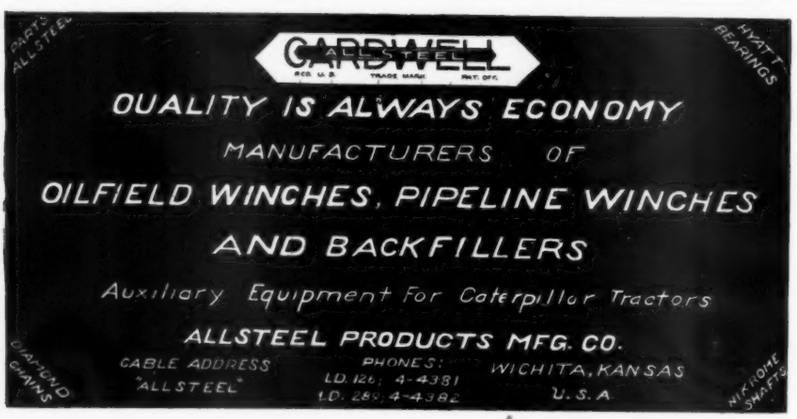


Unfavorable Market Curtails Drilling in North Texas

(Continued From Page 143)

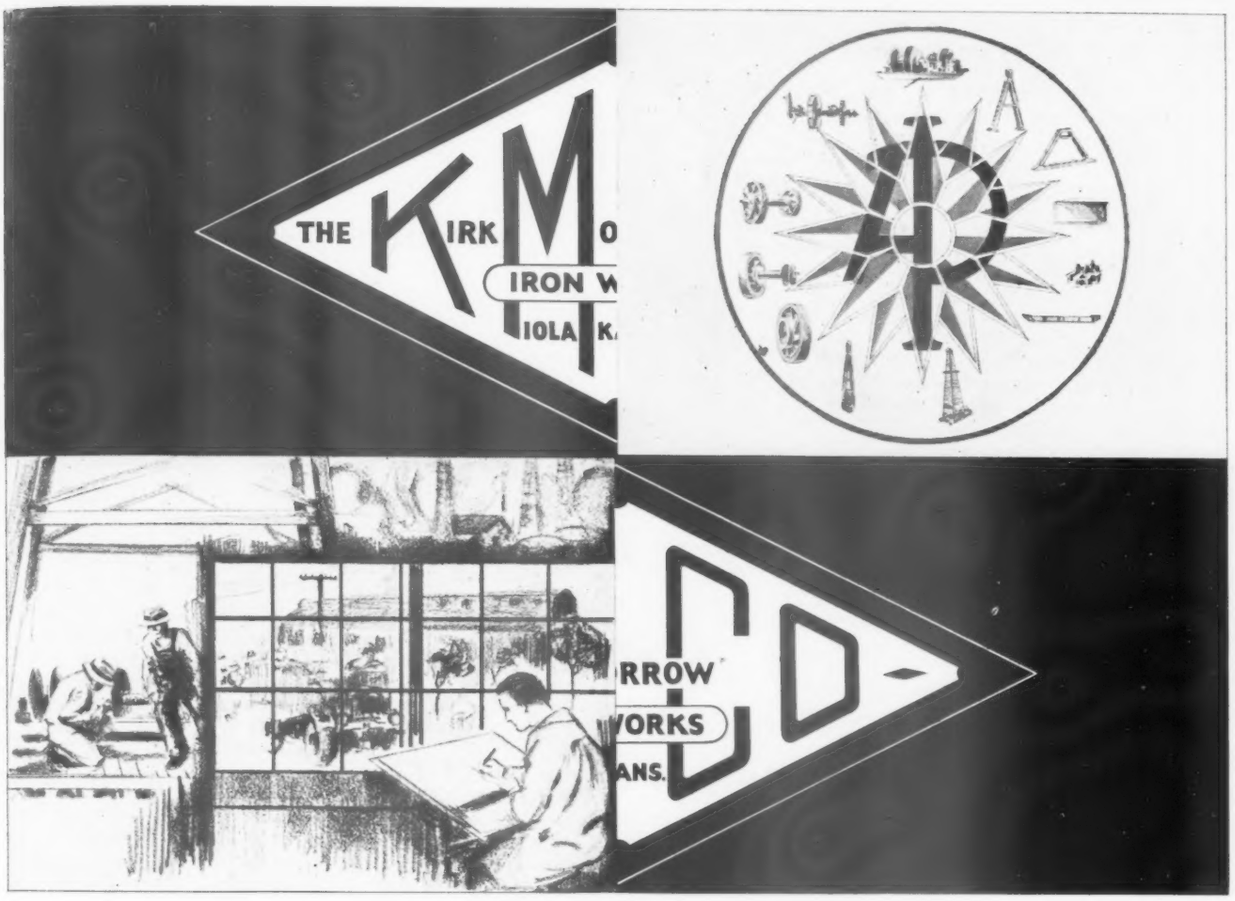
field, Ward County, and Gulf-McElroy section of Crane County's most productive area are conceded to have more than 500 proven, undrilled locations each, but both are controlled by Gulf Production Company, which has elected to operate only a few rigs in each field until market conditions improve. The Big Lake field is another outstanding example of closely held proven acreage, and the two companies sharing the entire field are carrying on a minimum of drilling operations. The 8500-foot horizon in the Big Lake field became proven over a large area within the past six months through the completion of large oil and gas wells by Big Lake Oil Company and Group One Oil Corporation. This deep horizon promises to double the early estimates made on potential crude recovery from the field, and although it is the deepest known oil and gas horizon in the world the cost of completing wells is averaging less than $150,000.

Judkins field, Ector County, came to the front within the past six months as an important source of crude supply for the district and was the only area that scored an appreciable gain in a daily output. Proration of the field is to begin August 1, but restrictions are being made because of difficulties experienced by some of the operators in finding a crude market outlet rather than from a threat of heavy production. This field will be one of the most active drilling areas in the district during the remainder of the year in order that production may be established on each 40-acre unit within the prorated area.

But for the decline in popularity of crude with local refineries and pipe line companies, the Howard-Glasscock County district would be the most active drilling area in West Texas. The oil produced from wells completed in the 2200- and 3000-foot lime horizon has been purposely dodged by leading purchasers since the first of the year, resulting in proration allowance being cut about 50 per cent, with a general curtailment of field work. Resumption of drilling to an active basis rests with the return of a favorable crude market outlet.

Central East Texas

Van field, Van Zandt County, is the only area in the district that has been active, and it is destined to continue at its current rate of development over the balance of 1930. This field is the only major oil area that has been unitized, and because of its type drilling must proceed without interruption until all leases and royalty interests are given one or more tests. About 15 rotary rigs will be operated steadily over the balance of this year within the original unitized area while recent extension of production to the northeast of the unit heralds an almost equally as large development program. In the meantime production is quite apt to be held to about 25,000 barrels daily.



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The KM CO diamond on a product speaks volumes—but it tells only half the story. Behind the KM CO trade-mark there are not only the records of performance of a wide variety of products but also a history which extends over twenty-five years—a story of experience in the field—conferences with users of equipment—months spent analyzing particular needs, followed by extensive designs and models to make sure that the finished products would more than do what they were expected to do. Gather all this data on the pages of oil industry progress, bind it with the spirit of service which cements our organization together, then stamp the diamond trade-mark on the cover and you have the story of KM CO.

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Numerous Geophysical Prospects Prove Disappointment
(Continued from page 136)

coveries, made with either seismograph or torsion balance, or both, and they include many prospects conceded originally to be other than the usual shallow domes which have yielded most of the oil in the Gulf Coast in the past. Instead, they were interpreted through the geophysical work as deep-seated salt domes or other unfamiliar structures. In contrast to the development of the older, shallow-dome prospects—on which the first test often encountered cap rock, salt or even oil—the drilling on these new prospects has been for the most part disappointing, although important oil and gas showings have been found in a few instances. Consequently, while drilling will be continued in those few more favorable areas, many of the other prospects are at least temporarily condemned. At the same time other prospects of similar nature, found recently, or held under lease for considerable periods, but as yet undrilled, are looked upon with added doubt. And furthermore, by reason of the slight promise offered by these recently tested areas, enthusiasm has died down greatly in the search for additional prospects and in fact there are now relatively few geophysical prospects in the whole Gulf Coast not yet tested by at least one well.

Instruments' Use Limited

At last, therefore, a practical limit appears to have been reached after seven years use of the torsion balance and the seismograph, marked by increasing numbers of discoveries from year to year with increased efficiency and thoroughness. In the meantime, including the areas discussed above and listed in the accompanying table, a total of over 175 discoveries have been credited to the geophysical instruments.

While these instruments cannot be definitely condemned through the recent and current unsuccessful drilling, and while some development will continue in spite of the small encouragement offered, these new, unusual type prospects as a whole appear at least temporarily eliminated as prospective oil fields. That being the case, and the search for additional prospects having greatly subsided, attention can now be concentrated to greater extent on the older and more promising prospects, where good showings have been found, or at least where domes or favorable structures are known definitely to exist. Thus it seems plausible to look for renewed activity in the future on those older, more promising prospects, with possible further weeding out of the less promising. A precedent for such elimination was recently set by Humble Oil & Refining Company when it gave up leases covering the Genoa prospect, Harris County, although the second of two mile-deep wells which the company drilled there was completed temporarily as a 25,000,000-foot gas well at 3425 feet, while several other oil and gas sands in the well were considered good enough to test through drill stem.

The concentration of increased activity on the more favorable prospects is exemplified in the development work that has been going on during this year in the Hankamer, Esperson, Moss Bluff, Port Neches, and Lost Lake fields in the Texas Gulf Coast and in the Port Barre and Bayou Blue fields in Louisiana.

Interest Shown in Old Domes

While the prospects and fields found by geophysical methods have been claiming a large amount of attention in the regular salt dome country, growing interest has been turned during the past year to the old domes for deep production possibilities, largely because of the success attending recent and current deep sand development at Barbers Hill and Humble. The latest old dome to assume importance as a deep field is North Dayton in Liberty County, where several good wells have been completed on the south flank of the dome from sands found around 5000 feet. Barbers Hill came in as a deep field late in 1928, but by the end of 1929 the deep production was still limited to the east and south flanks of the dome. Early in 1930 Humphreys Corporation completed a prolific well on the northwest flank from 6404 feet, and since then even deeper production was obtained farther south along the west flank by Yount-Lee Oil Company. The original deep production on the east and south sides ranged from 5100 to 5400 feet, but a short time ago Humphreys Corporation deepened a 5200-foot producer to 6200 feet, at which depth it was completed as a fair pumping well, heralding the development of at least one other deeper zone on that side of the field. Meanwhile production has also bee nestablished from deep sands off the north flank of the field. The success in deep drilling on the southeast flank of Humble dome during 1929 resulted in deep prospecting on the west flank, and early this year, on that side of the field Sun Oil Company completed an 1800-barrel producer at 3903 feet. Several other wells have since been brought in in that area, and there is also deep production now on the east and north flanks of the field.

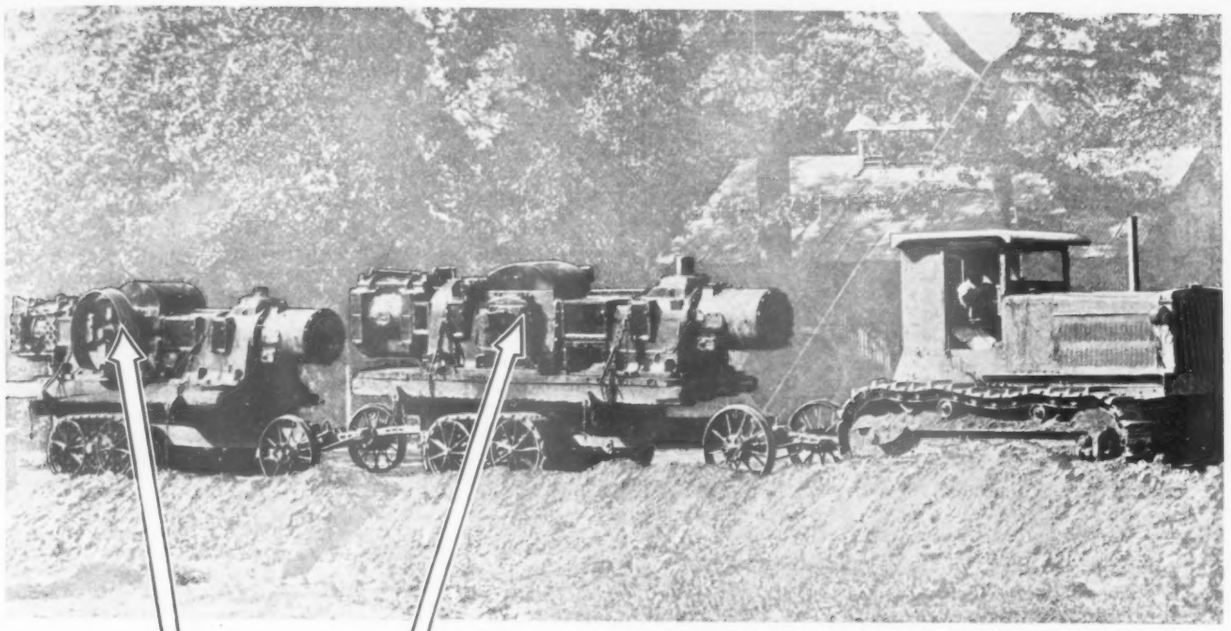
The outstanding deep development in South Louisiana has been in the Evangeline field, Acadia Parish, where Yount-Lee Oil Company now has three completed wells on the southeast flank ranging from 7292 to 7447 feet. The Texas Company's Rayne Heirs 5 on the south flank of the Evangeline field, still drilling at 8475 feet as this is written, holds the record as the deepest test ever put down along the Texas-Louisiana Gulf Coast. Barbers Hill and Humble, however, also have to their credit one well each drilled below 8000 feet. Compared with the greatest producing depth in South Louisiana of 7447 feet at Evangeline is that of 6661 feet in the Texas Gulf Coast in Barbers Hill field, although non-commercial production has been obtained below 7000 feet in both the Barbers Hill and the Esperson fields. All of the present records in both the Texas and the Louisiana divisions of the Gulf Coast, in producing depth or in depth reached, have been set during 1930, and such records as have been set during the year have commonly been broken in short time by new ones, with the prospect that drilling to 10,000 feet or deeper is just around the corner.

Phillip Maverick

Consulting Geologist

Western Reserve Life Building

SAN ANGELO, - - - - TEXAS



25 tons

20 tons

45 TONS

Some Load

Overloads are, of course, always to be avoided but occasionally emergencies arise where definite capacities must be overlooked. Such a condition is shown here—45 TONS—being handled by two 15-ton Atheys and one tractor. Can there be any better proof of the tremendous strength and added factor of safety built into Athey wagons than their performance under this 50% overload?

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Petroleum Building,
Houston, Texas

Lack of Market Outlet Holds Down Development in Kansas

(Continued from page 134)

such handicap. This campaign will result in about 100 wells being drilled for the whole year, with fully three-fourths of them to be completed in the final six months of 1930.

Voshell is a Wilcox sand pool in 21-2W. Completed wells now number 83 and the output is rated at 50,000 barrels daily. Early in July pipe line concerns were forced to reduce runs to less than 10,000 barrels daily. The limits of the field have not been set. The curtailment of runs has had its effect on drilling. Whenever it is possible to get the oil moved, Voshell is certain to see its drilling campaign carried to the point that its full possibilities as to area and output may be known.

The Ritz pool, also in McPherson County, 20S—2W, is smaller, having but 12 producing wells. Like Voshell its full development has been held back because of proration of oil runs.

Work Halted

Drilling in the Schurr pool of Rice County has been halted because the field is without a market. Only five wells have been completed there. These were over a period held down to 50 barrels daily for each well. But further market restrictions in July forced buyers to cease taking any oil from Schurr. Since then drilling wells have been halted above the oil producing formation and indications are that the next few weeks will see all drilling stopped until there is a market for the oil.

After production was found at Schurr, drilling was started in the Raymond townsite, which promised to extend production a mile to the southeast and give the pool substantial area. But this drilling so far has failed to bring expected results. All the outside wells have not been completed, but those to reach the level, where production could be expected have been disappointing.

Present indications are that the Schurr area will come to a status of inactivity, which will not be ended until there is a market for oil. Contracts may force some wells to continue, but indications are that the last half of the year will witness less of the search for new production in central and western Kansas.

In mid-July one of these outside tests gave evidence of uncovering another Rice County pool. This well drilled by Tatlock and Elwell's Plogg 1, C SW SE, 33-18-9w, began showing oil at 3270 feet, from a formation not yet identified. This well is 15 miles northeast of the Schurr pool. Owners are Empire Oil & Refining Company, Carter Oil Company, J. A. Hull Company and Shell Petroleum Corporation, as well as the two men who drilled the well.

Drilling For Gas

Although it has had less consideration than has some of the oil areas, Morton and Stevens Counties, in southwestern Kansas, will require more drilling for the remainder of the year than any other Kansas district. Natural gas is the objective of wells, which are drilling to 2800 feet, where gas is found at the base of the Permian series of rocks.

This gas area is being developed as an additional supply for natural gas trunk lines, which are being built out of the Texas Panhandle into industrial centers of the Middle West. So far only small wells have been completed but they are rated for long life.

The extent of this gas area is not yet determined. Wells are being drilled in the middle of quarter sections. In this way the gas reserve will be outlined and then wells can be drilled closer together to establish the amount of gas needed daily.

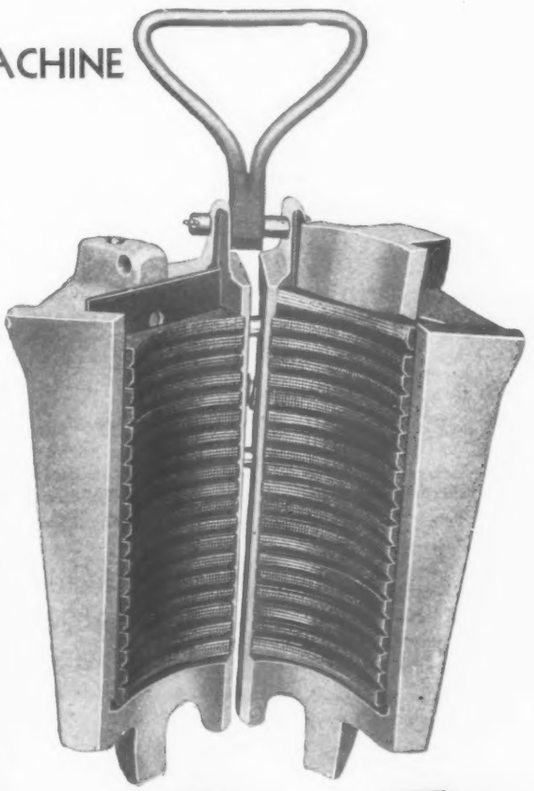
While conditions indicate a lessening of drilling activity for all of Kansas over the last half of 1930, the prospect over a longer period is to the contrary. Fully half the state west of Wichita is under lease. More than 500 large blocks are held, in addition to the checkerboard acreage. These leases cover long periods and the property thus held will be tested prior to the expiration of leases.

MISSION SLIPS

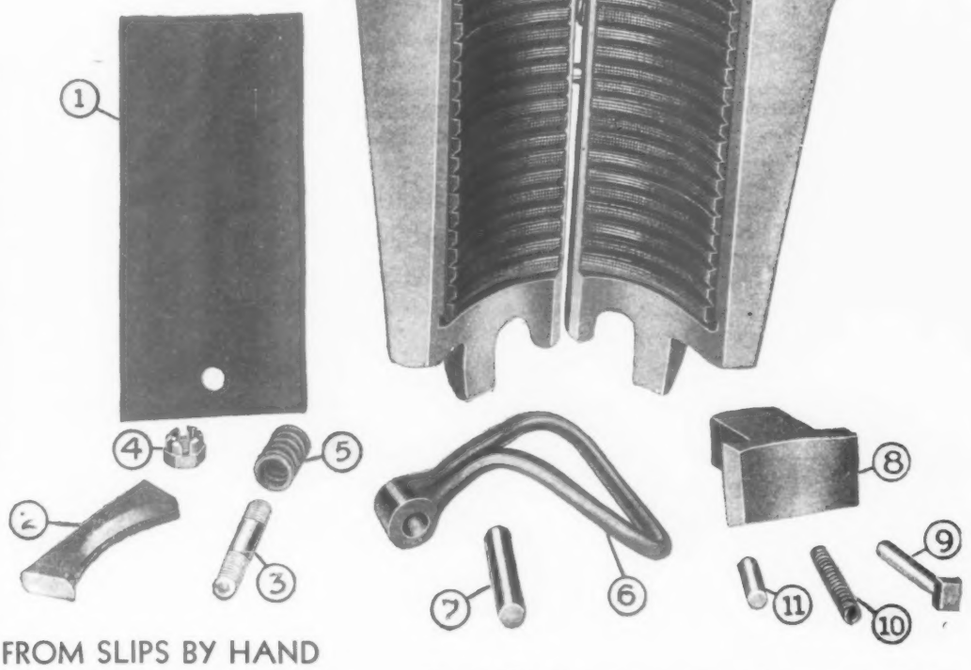
TOOK THE LIMIT OF TESTING MACHINE 200,000 POUNDS

In a recent test at Rice Institute, Mission Slips were subjected to the capacity of the Tinius Olsen Tension-Compression Testing Machine. How much greater load the Mission Slips would take, we do not know, since 200,000 pounds is the limit for this particular testing machine.

This 200,000 pounds pressure is equivalent to .... 13,333 feet of 13.3 lb. 3 inch drill stem with 44 lb. A.P.I. tool joints on every joint .... figured on the weight of the pipe hanging in the air.



PARTS
(1) Back Plate
(2) Dogs (Teeth)
(3) Body Bolt
(4) Body Nut
(5) Body Spring
(6) Handle
(7) Handle Pin
(8) Cap
(9) Cap Bolt
(10) Cap Spring
(11) Cap Spring Pin



PIPE REMOVED FROM SLIPS BY HAND

At the conclusion of the test the pipe was removed from the slips by hand. No other slip tested by this machine has ever permitted such ease in removal of pipe. Such results reflect the perfection of engineering design and balance of the Mission Slips and explain why much pipe is saved due to that quality in design which allows these slips to handle long strings of pipe without damaging same.

Mission Slips have proven over and over in the field that they do not damage drill stem by cutting or bottle necking.

INVESTIGATE NOW the money making advantages of using Mission Slips that pay for themselves over and over on the pipe they save.

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Box 1852, Tulsa, Oklahoma, U. S. A.

Two Wyoming Deep Tests Hold Interest

Casper.—Midwest Refining Company's two interesting deep tests in central Wyoming—one in the heart of the Salt Creek field and the wildcat well on Midway Dome, 12 miles north of Casper—drilled at the same depths for a short time last week, and then the Midway Dome rotary test passed ahead. On July 17 it was drilling at 4953 feet, and the Salt Creek well was at 4905 feet. The latter was spudded in August 8, 1929, drilled to 1765 feet with cable tools, changed to rotary for a time, and then went back to cable tools.

The Midway test was spudded in with cable May 4, 1930, and drilled to some 200 feet where surface casing was set; it was then turned over to an Olson Drilling Company rotary outfit which has made amazing progress in the course of a little less than two months. It has proved the success and efficiency again of rotary drilling in the Rocky Mountain states where cable tools have been the favorite to date, in most fields. Oregon Basin field, in northwestern Wyoming, is the only field in the north Rocky Mountain states which employs the rotary almost exclusively at present.

Richfield Oil Company Awarded Navy Contract

Los Angeles.—Richfield Oil Company of California has been awarded a contract by the U. S. Navy Department for 1,050,000 barrels of Bunker "C" fuel oil, covering Navy requirements at Pearl Harbor, Hawaii. The contract was awarded Richfield Oil Company at a price of $.872 per barrel, with Union Oil Company bidding $.8825, The Texas Company $.90, Associated Oil Company $.935, Shell Oil Company .95, and Standard Oil Company of California $1.15. Deliveries are to be completed by June 30, 1931.

During the year ended June 30, 1930, Richfield Oil Company delivered 700,000 barrels of Bunker "C" fuel oil to the Navy at Pearl Harbor on a contract awarded during 1929.

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We are now manufacturing two special grades of superior absorption oils.

GRADE NO. 1—For new type plant—Initial 325 F.—Endpoint under 450 F.—Gravity 41/42—Molecular weight 150-160—Prime Color—Doctor and corrosion test.

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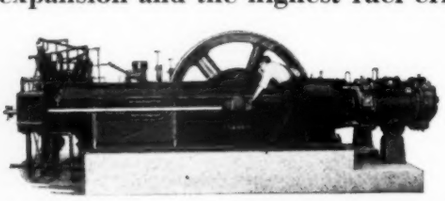
With the idea in mind of obtaining all the useful power possible from a cubic foot of gas, the designer of this new TRANSIT 17x24″ Gas Engine Compressor has worked directly towards this end.

The result is a new engine in the fullest sense of the word. In efficiency and economy we have achieved the ultimate—the indicator cards prove it.

In designing the regulating valve mechanism, care has been taken to keep the proportion of gas and air uniform for every position from no load to full load. Special arrangements have been made for insuring a very thorough mixture of gas and air as they enter the cylinders. This results in a quick burning mixture, insuring full expansion and the highest fuel efficiency.



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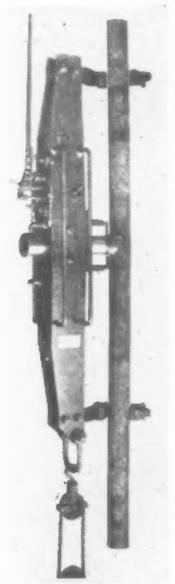
Hydraulic Pipe Straightener

HAHN & CLAY COMPANY

Cliff and Phil Davis are the designers of a new hydraulic derrick pipe straightener, which is being manufactured and distributed at the shops of Hahn & Clay Company, 1800 Franklin street, Houston.



Hydraulic Pipe Straightener

This new pipe straightener is six feet long and weighs 590 pounds. It has a lifting capacity of 60 tons, and handles damaged pipe from 6⅝-inch down.

Uses of this pipe straightener include the straightening of drill pipe or kelly joints, casing, tubing or steel derrick legs or for jacking up derrick legs. For work immediately on the job, the pipe straightener is hung on a cat-line in the derrick. One of its chief uses is the straightening of drill stem, kelly, casing or tubing while being run into or pulled from the hole. It is for use also in shop work, where it is set horizontally instead of vertically as in the derrick.

A steel hook on each end of the body holds the pipe in place where six-inch is being straightened, and adapters are placed in these hooks for holding smaller pipe. The machine is hand operated, the working of a detachable lever forcing by hydraulics a ram against the pipe to be straightened, as is shown in the accompanying illustration. A half-moon jaw of steel on the end of the ram fits against the pipe. Patent on the machine is pending.

Further details on this pipe straightening machine will be furnished by Davis Brothers upon request to the above address.

Tubing Tongs

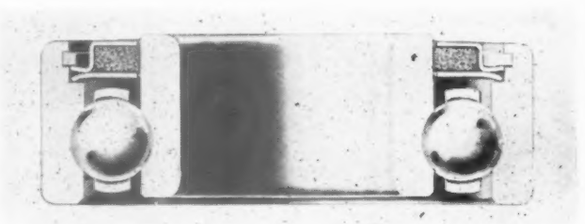
OIL WELL SUPPLY COMPANY

Oil Well Supply Company, Pittsburgh, is now manufacturing and selling its new three jaw double-die tubing tongs which have practically eliminated all danger of crushing or denting tubing, whether it is new or old, thick or thin. Accuracy in the machining and reaming of the inside jaws gives a perfect fit around the tubing, and sagging or misalignment of the jaws is prevented by the use of extra large steel pins.

When "breaking out" or "making up" tubing positive grip is provided for when the two tool steel dies, one in the back jaw and one in the front jaw, become engaged when the jaws are closed and the tongs are in operation. The tongs may be passed down the tubing from one man to another without danger of slipping because of the quick-gripping action which is characteristic of this new design.

These new "Oilwell" tongs are made in sizes of two inches and 2½ inches and weigh 18½ pounds and 22 pounds respectively. They are light in weight and have proved very efficient in the handling of tubing with greater speed and convenience.

"Oil Well" Tubing Tongs



S-K-F Felt Seal Ball Bearing

Felt-Seal Ball Bearing

S K F INDUSTRIES, INC.

S-K-F Industries, Inc., announces the development of a new type of Felt-Seal ball bearing which is provided with a felt seal as the integral part of the bearing, making it necessary to provide only one housing enclosure.

Special features of the new ball bearing include manufacture of all the parts from high carbon, chrome alloy steel, parts ground to international standard dimensions, and simplicity of installation and extraction with less danger of damage to the parts. Disassembling of the bearing is a matter of only a few minutes and very little effort. New felts can be easily applied, making it more economical and conducive to longer life for the bearings.

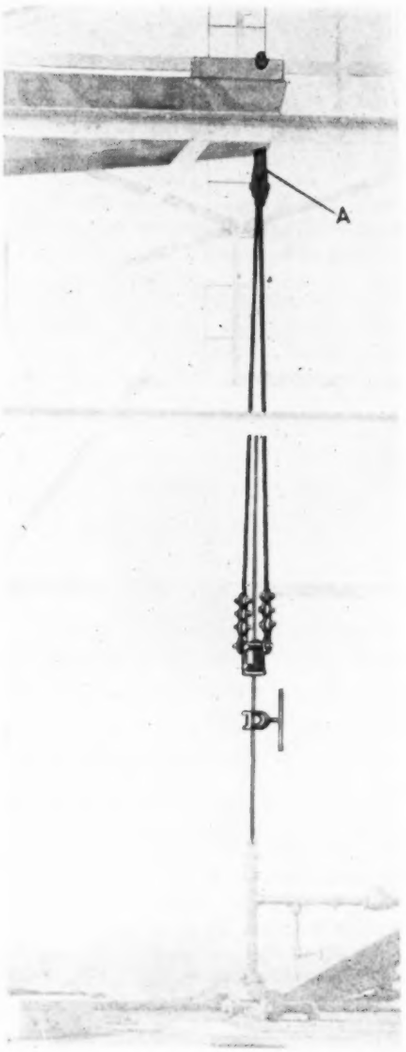
Goulds Pumps, Inc., Seneca, New York, is now distributing the second issue of its centrifugal pump selection chart bulletins, covering multi-stage pumps for the capacities up to 2000 G. P. M. and heads up to 2400 feet.

In the second bulletin, as in the first, a comprehensive group of charts is given, enabling the prospective pump user to quickly and easily determine the pump best suited to his individual requirements. Cross sections, bearing details, and dimensions for each pump are included in the new bulletin with illustrations of the pumps under actual working conditions. These bulletins may be secured on request to the manufacturer.

Cameron Iron Works, Houston, has issued a new book on the tubing control heads. This new booklet contains complete details of construction, and instructions for opera-

RATIGAN
No. 1 Beam Hanger

Sheave Wheel for Wire Line Connections to Polish Rod Grip



No. 19 Equalizer Bar and 2 No. 38-1 Rod Eyes for Rod Rein Connections to Carrier Bar and Grip.

Designed for Dependable Service

The above view shows the No. 1 Ratigan Beam Hanger (A) on a standard wood beam. It is equipped with No. 6 Ratigan Grip, No. 6-5 Wire Line Clamps and No. 2 Ratigan Polish Rod Clamp. Hanger Stem is of heavy "I" Beam construction. This is an ideal combination for wells where a straight lift hanger is not required. Bulletin No. 12 gives full details—write for it.

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tion of these heads. It also gives an exhaustive study on their uses and application for high pressure work.

Tubing control heads are made in two sizes, the extra heavy duty and the standard type. By use of these heads tubing may be subbed against pressure and the well may be brought in through the tubing. They also serve as part of the well manifold with the tubing suspended on the rams in the control head, and they allow washing the well through the tubing.

Copies of the booklet may be had by writing Cameron Iron Works, Houston, Texas.

G. C. Myers has been appointed Gulf Coast field salesman for Hydraulic Equipment Corporation, which is affiliated with Thrift Corporation, 953 Merchants & Manufacturers building, Houston. These two companies have a line of hydraulic equipment, including the casing pulling machine, a hydraulic screen cleaner and a hydraulic whipstock. Thrift Corporation is the Gulf Coast distributor for Hamer Oil Tool Company's all-steel rotary hose, five of which have recently been placed in Gulf Coast fields. Myers' oil field experience covers more than 10 years, from warehouseman to drilling contractor.

E. C. Frey, formerly general manager and treasurer of Harrisburg Pipe and Pipe Bending Company, Harrisburg, Pennsylvania, has organized a company operating under the name of Frey Steel Products Company. The purpose of this company is for the manufacture and sale of lightweight sections, such as channels, angles, etc.

The plant is located at Milton, Pennsylvania, and the office at 620 Lewis Tower, Philadelphia. Pearce Fireproof Company, Philadelphia, is acting as distributor. Associated with Frey is F. D. Andrews, formerly general superintendent for the Harrisburg company.

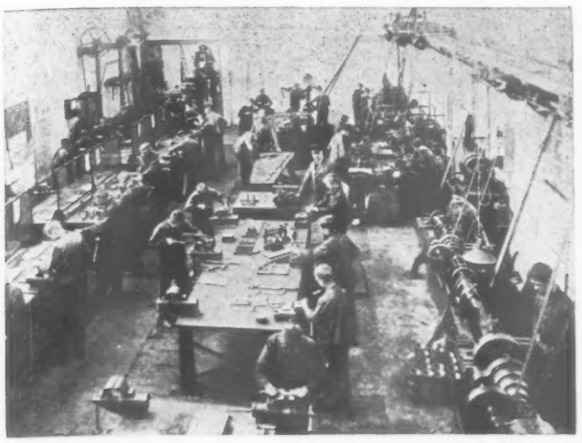
Millard D. Meyers, who has been rolling sections for a number of years both at Johnstown and Harrisburg, will have full charge of operations.

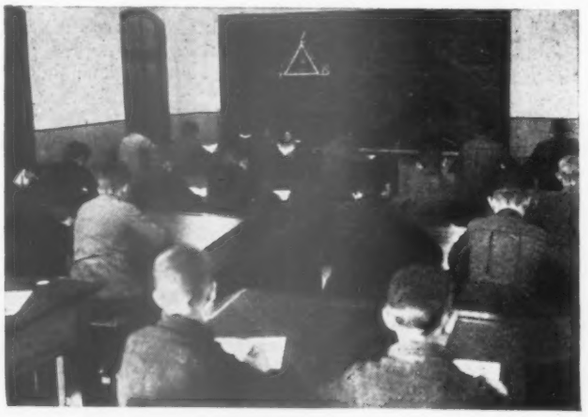
Ash Grove Lime & Portland Cement Company has moved its general offices from the Grand Avenue Temple Building to the new Fairfax Building, located on the southwest corner of Eleventh and Baltimore Streets, Kansas City, Missouri. In this new location the entire eleventh floor will be occupied. District sales offices will continue to be maintained at 1200 Petroleum Building, Oklahoma City.

M. J. Harper has recently been appointed to succeed Victor E. Arnold as manager of the New York City office of the Pittsburgh Equitable Meter Company. Mr. Harper is well fitted to fill this position through his experience in handling the export sales of the company for many years, as well as taking care of many important accounts in the New York territory.

Tulsa.—With J. M. Berry as chairman of the board of directors and W. O. Buck as president, both residents of Tulsa and long identified with banking in the Southwest, the Fourth National Bank of Tulsa has been organized with a paid in capital of $300,000 in cash. The directorate includes many who are intimately connected with the oil industry in the Mid-Continent field, both in the producing, refining and marketing as well as the manufacturing of oil field equipment. J. M. Berry formerly was directing head of the Tulsa National Bank before its acquisition by First National Bank and Trust Company of Tulsa and W. O. Buck was vice-president and trust officer of Central National Bank of Tulsa and later vice-president of Exchange National Bank of Tulsa.

Manufacturer and Supply Dealer Notes





Apprentice work shop and school room in the Wirth factory, Erkelenz, Rhineland

German Oil Tool Factory Makes Varied Line

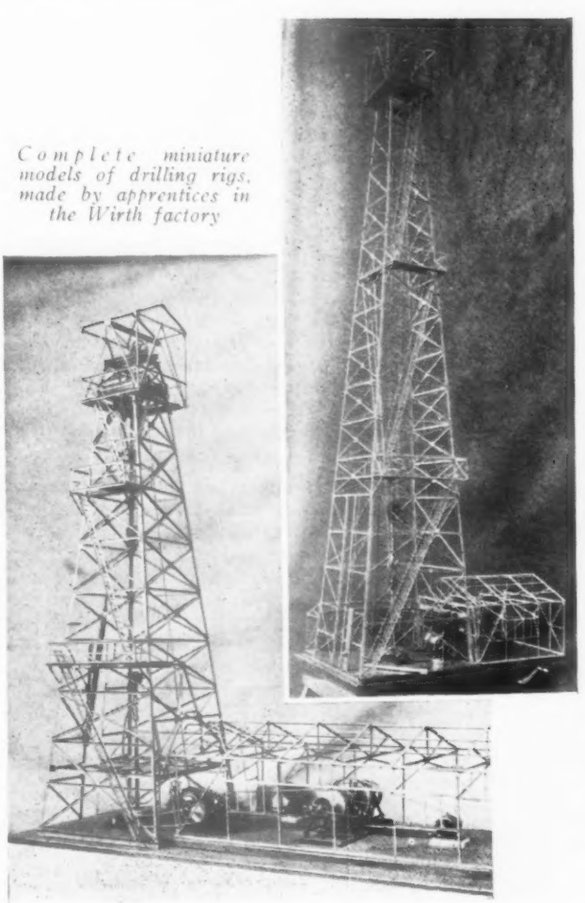
One of the most interesting features of a survey of the European oil industry is an inspection of the Alfred Wirth plant at Erkelenz, Rhineland, where drilling tools and oil well supplies are made not only for the German oil industry, but also for export to Poland, Roumania, Russia and the Far East. It might be said that the Wirth factory, which is the largest of its kind in Continental Europe, supplies the greater part of the world's demand for drilling equipment, except that which is manufactured in America and, more recently, in England. The Wirth line extends from manually-operated percussion tools to modern rotary equipment of the very latest design. The bulk of the percussion types of drilling equipment formerly used almost exclusively in European fields was produced at Erkelenz.

An institution of this magnitude is, therefore, of considerable economic importance; and it is very interesting to observe the differences between German and American manufacturing policies. Herr Wirth explained that mass production methods are not possible in Germany, by reason of the extremely varied nature of the demands made upon the European manufacturer. He might, for example, receive in the same mail orders from domestic sources for Fauck or Raky equipment; from Poland and Roumania for Austro-Galician and Alianta machinery; and from India and the East Indies for rotary tools. European oil producers, unlike Americans whose policy it is to depend upon their supply dealers to design and develop their equipment before offering it for sale, customarily make it their practice to submit their own special specifications. For these reasons, it is practically impossible for the European manufacturer to carry large stocks of equipment on hand for immediate delivery as is done in the United States. The Wirth plant, however, is equipped to turn out rotary and cable tool equipment conforming to A. P. I. specifications; and its trade in this department is increasing as rotary equipment continues its invasion of European oil fields.

Due to the wide variety of equipment manufactured, the Wirth firm requires machinists whose training has been of a thorough and comprehensive nature; it cannot employ workmen whose training has been of a specialized or limited nature. This being true, it devolves upon the company to train and educate its own workmen.

From 30 to 40 14-year-old apprentices are accepted at the Wirth plant every year. These boys are bound over by their parents, who delegate all parental authority to the officials of the firm, including the right to administer discipline and corporal punishment where necessary. The apprenticeship embraces a term of three years, which includes one year in the school room and model shop and two years in the plant under the tutelage of journeymen machinists. Their class room work

Complete miniature models of drilling rigs, made by apprentices in the Wirth factory



includes the three R's and a thorough ground work in physical culture and manual training. Special instructors devote their whole time to their preliminary training. The first year represents a dead loss to the firm, as they engage in no productive labor during that period.

Instead, they begin by learning to use and care for such simple tools as hammers, saws, and files; and then gradually progress to the manufacture of small-scale models, complete in every dimension and every detail, of all the various types of drilling equipment. The model shop is fully equipped with its own special machines, lathes, and drill presses, including its own small forging hammer.

Apprentices work 48 hours per week. During the first year they are paid 21 marks ($5.25) per month, which is increased to 35 marks ($8.75) during the second year, and 40 to 42 marks ($10 to $10.50) per month during the third year. Boys who contribute to the support of their parents receive a higher scale of wages, in recognition of their family responsibilities.

ELLSWORTH GRAY

Ellsworth Gray, organizer of Gray Specialty Company, 6418 Esperson street, Houston, manufacturers of specialty high pressure equipment, including the new "Brownie" high pressure head, and fishing tools, is one of the oldest oil field equipment manufacturers in point of service in Texas. He entered Spindle Top field, Beaumont, shortly following completion of the Lucas well, in 1901. With a machine shop there he did repair work and designed special tools to overcome drilling and production problems. For more than 12 years he designed and improved equipment in the Gulf Coast.

In 1915, Gray went to Venezuela, representing Barber Asphalt Company in engineering work. After two years of service there he returned to Texas, and in 1919 he organized the Gray Machine Tool Company at Humble, which did mainly repair work. Three years later he organized Gray Tool Company in Houston with Ed. J. Drake, W. K. Hughes and R. A. Mueller, manufacturing a special line of fishing tools.

He left Gray Tool Company in 1929 and organized Gray Specialty Company, which in less than two years has expanded its shops and manufacturing facilities to more than three times the original size.

J. H. Bannister, Gulf Coast territory representative for Gulf Coast Machine & Supply Company, Beaumont, and for Petroleum Equipment Company and Oil Field Engineering Corporation, Fort Worth, has moved his office and warehouse from 1015 North San Jacinto street to 306 Merchants & Manufacturers Building, Houston.

Gulf Coast Machine & Supply Company manufactures and distributes its own forged steel braden head, tubing crown and traveling block, Banner brant bit and forged steel pump liner, manufactures and distributes in Texas the Johnston trip valve and Johnston float valve, and manufactures and distributes the Appleman gumbo bit. Petroleum Equipment Company manufactures and distributes Nu-Alloy balls and seats, the Petro oversize standing valve and the Petro traveling valve. Oil Field Engineering Corporation manufactures and distributes the Ofeco stuffing box and the Bal-Re-Nu ball and seat check valve.

Halliburton Oil Well Cementing Company, Duncan, Oklahoma, has recently ordered two FWD trucks for its oil field cementing work. The two new trucks are oil field specials, 148-inch wheel base, 56-inch tread ,six KS motors of 76 b.hp., BT power take-off with 17-inch shaft.

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After months of arduous research in our laboratories we are now able to offer a Permissible, Bureau of Mines Approved Canister on All M-S-A Tank Gaugers' Masks for Protection against Organic Vapors and Acid Gases, including Deadly Hydrogen Sulphide Gas from Sour Crudes and Distillates. This announcement is of special importance to the Oil Industry.

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B & B Line "spools pretty" on the cable tool rig of Magnolia Petroleum Company's Homsley No. 3, Earlsboro, Okla. Left: Jack Lee, Tool Dresser; Right: R. S. Stanley, Driller.

NR-696

"Just Naturally A Good Line"

Listen to R. S. Stanley, Driller, calling down Jack Lee, Tool Dresser, for saying they have good luck with their *B & B Cable Tool Drilling Lines:* "Good luck, your eye! It's just naturally a good *line.*"

Naturally **it is. The wire is specially drawn and put through four very strict tests. It is laid up on machinery designed to impart to the rope that *springy* quality which makes drillers call it "the easiest handling line made—a mighty pretty spooling line that you can count on to drill ahead of the tools."**

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SQUEAKS FROM THE BULL WHEEL

So your lawyer decided that you had no further recourse.

Yes, but not until I had no further resource.

Why did you hit your wife with a chair?

Because I couldn't lift the table.

Arthur—Dear, didn't you notice that the sauce at the hotel last night tasted of furniture polish?

Martha—Yes, darling. But it went well with the cabinet pudding.

"Ten cents worth of bicarbonate of soda for indigestion at this time of night," cried the infuriated druggist, who had been aroused at 2 a.m., "when a glass of hot water would have done just as well!"

"Weel, weel," returned MacDougal, "I thank ye for the advice, I'll no' bother ye after all. Good night."

Joax—I know a man who nicked Gene Tunney under the chin and stretched him right out.

Hoax—You don't say! who was it?

Joax—Tony, the barber.

MacTight—I have nothing but praise for the new minister of our church.

O'Malley—So I noticed when the plate was passed around.

Flapper Fan—Got a cigarette?

Sheiky Dan—But I thought you came out in the garden with me to give me a kiss?

Flapper Fan—Yeah, but I'd better lay down a smoke screen first so nobody will see us.

A pretty young woman stepped into a music shop in the city the other day. She tripped up to the counter where a new clerk was assorting music, and in her sweetest tones asked: "Have you 'Kissed Me in the Moonlight'?"

The clerk turned, looked, and said: "It must have been the man at the other counter. I've only been here a week."

Foreman (to applicant): "Yes, I'll give ye a job sweeping and keeping the place clean."

Applicant: "But I'm a college graduate."

Foreman: "Well, then, maybe ye better start on something simpler."

Policeman: "Judge, this man is arrested for gambling and being drunk."

Drunk: "Your Honor, 'Man's inhumanity to man makes countless thousands mourn.' I'm not as debased as Swift, as profligate as Byron, as dissipated as Poe, or as debauched as—"

Judge: "That will do. Thirty days; and officer, take a list of those names and run them in; they're as bad as he is."

"I'm looking for my ideal dog," said the lady in the canine fancier's shop. "I'd like one with a head rather like a collie and a body after the style of an Irish terrier, only with longer hair and nice, distinct markings. Do you keep dogs like that?"

The dog fancier shook his head sadly. "No, ma'am," he said. "I drowns 'em."

The new teller's first day had just ended and things were in a mess.

"What do you mean," shrieked the exasperated bank president, "by telling us you have had five years' experience in banking when you never had a job before?"

"Well, you see, sir," replied the trembling young man, "you advertised for a man with imagination."

Ronald—And is $10 all you are offering for the return of your wife? Why, no one will bring her back for that small amount.

Edward—Don't I know it!

Oshkosh—Why don't you like girls?

Kennebunk—They're too biased.

Oshkosh—Biased?

Kennebunk—Yes—bias this, and bias that, until I'm broke.

He: "Pardon me, has your dress slipped off, or am I seeing things?"

She: "Both."

"Can you give me an example of a paradox?"

"A man walking a mile, but only moving two feet."

"Have you ever been arrested before?"

"Arrested before! I ask you—do I look like an amateur making my debut?"

Her (at a ball game): "I don't see how that umpire manages to keep cool."

Him: "That's easy. There are a thousand fans around him."

Stella — (at the seashore) — Look! Mary's sinking! Count Bugsky's trying to save her! D'ja 'spose she's drowning?

Bella—No. I think she's just gone down for the count.

OLD KON SAYS:

"Hot berries! What a life! A feller can't even go fishin' without the whole place gettin' tanked up on oil that needs treatin'.

"Times like this is when you're thankful there's a drum o' Kontol handy."

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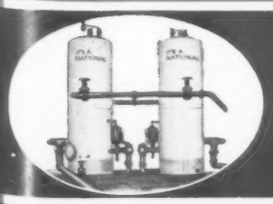

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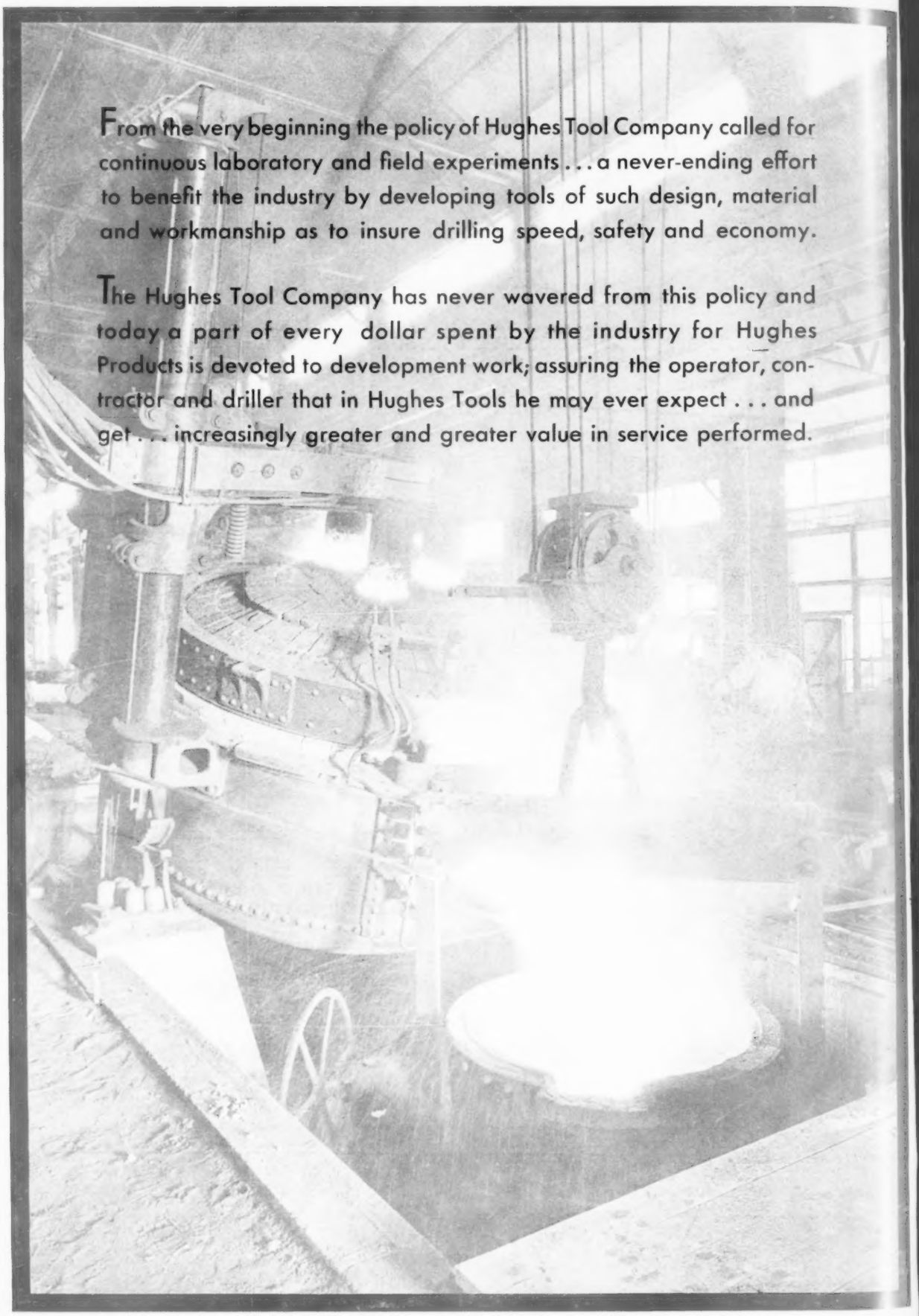

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